

AWARD-WORTHY IT

Smithsonian Award finalists range from a high-tech grade school to the world's largest online auction. Check out this year's innovators. Page 40

E-REALITY CHECK

The e-marketplace is no picnic. Prickly suppliers and thorny legal issues are only the beginning. Page 58

PREFAB PORTALS

Off-the-shelf portal packages are easy and cheap, but do they do the job? Page 86

COMPUTERWORLD

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BACKLOG KEEPS VISAS ON SHELF

At swamped INS, permanent visas delayed; guest workers might have to return home

BY JULEKHA DASH

As U.S. lawmakers continue to debate whether to raise the visa cap on temporary foreign workers, half of the employment-based permanent visas went unused last year. That's because of a severe backlog in visa processing, which is forcing thousands of technology workers to wait three or more years for green cards.

Though employers exhausted the 115,000 H-1B visas six months into this fiscal year, the U.S. Immigration and Natural-

VISA CAP DEBATE

ization Service last year issued fewer than 80,000 of the allotted 140,000 employment green cards. INS spokeswoman Eyleen Schmidt said a backlog in visa processing was partly to blame. The INS is now considering more than 1 million green-card applications.

Lisa DeFruscio, a human resources director at security software firm DefendNet Solutions Inc. in Providence, R.I., called the INS backlog "absurd," adding that the agency

INS Backlog, page 121

ALL-STAR VOTING FRAUD TARGETED

Baseball goes deep to tighten online security

BY MICHAEL MEEHAN

Major League Baseball's All-Star Game has been taking great pains to make sure fans don't hack, hack, hack for the home team.

As voting to pick this year's players gets under way — the first round of balloting was posted online last week — All-Star officials hope to double online response, but without a repeat of an incident that oc-

curred last season. That's when a fan from Carver, Mass., tried to stuff 39,000 votes for Boston Red Sox shortstop Nomar Garciaparra through the online balloting system.

"Baseball, clearly, coming off last year's issue, was concerned about this," said Tim O'Mara, senior vice president of operations at SeasonTicket.

All-Star, page 14



A FAN SUBMITTED 39,000 votes for Nomar Garciaparra last year



UNITED STATIONERS CIO Ergin Uskup offers employees flextime to accommodate their schedules — and keep them on staff

TOP-NOTCH EMPLOYERS

FLEXIBLE SCHEDULES SO YOU CAN ATTEND a child's school play. Company-paid classes in Spanish and yoga. The ability to choose your own projects. That's the kind of work environment you'll find at companies in *Computerworld's* 7th annual list of the Best Places to Work in IT, the result of an extensive survey about staff training, teamwork and turnover.

The first installment of this four-part series begins on page 61.

Best IT Workplaces

- The Home Depot Inc.
- Cabot Corp.
- Federal Express Corp.
- Harrah's Entertainment Inc.
- Texas Instruments Inc.

MICROSOFT SETS STAGE FOR APPEAL

Legal experts say it may have a strong case

BY MITCH BETTS
AND PATRICK THIBODEAU
WASHINGTON

Microsoft Corp., trying to score points with a future appeals court, last week blasted the government's breakup plan

as vague, hasty, extreme, unjustified and riddled with errors.

For months, Microsoft has been laying the groundwork for an appeal of U.S. District Court Judge Thomas Penfield Jackson's antitrust rulings. Besides opposing the decision that Microsoft abused its monopoly position, the company has repeatedly complained

that Jackson didn't allow it to call witnesses to debate the merits of splitting it in two.

Details of the breakup proposal will get more attention this week. Jackson ordered the government to respond to Microsoft's specific complaints by today. Microsoft can file a final rebuttal on Wednesday, and Jackson is expected to rule on the breakup plan shortly thereafter.

Microsoft, page 16

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OFF TO THE EXECUTIVE SUITE

In the growing world of e-commerce and online marketplaces, technology is at the very core of business. So naturally, CIOs are in demand. IT leaders, like Carl Bass (pictured), are becoming CEOs at their companies' dot-com spin-offs or taking the helm at new Internet start-ups. Page 52



JAMES WASERMAN



GOING IT ALONE

Have you been bitten by the entrepreneur bug, like iMedium's president and recent founder Brian Donner (pictured)? Are you dreaming of hanging out your own shingle, to be your own employer? Then consider the words of wisdom from two who have done it. Page 92

COMPUTERWORLD THIS WEEK

JUNE 5, 2000

NEWS

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- 8 GETTHERE.COM** plans a network that would link corporate customers directly with airlines, hotels and car rental agencies.
- 10 THE NET WILL FUEL** growth in customer relationship management and supply-chain software sales and slow demand for enterprise resource planning, analysts predict.
- 12 PALM INTRODUCES** software to link handhelds with corporate information systems.
- 16 ETRADE MERGES** with Ernst & Young to offer personalized financial advice on the Web.
- 20 BAAN SALE LEAVES** users wondering about the future of the German company's products and support.
- 24 USERS ARE WARNED** about a security hole in Network Associates' Gauntlet firewall software.
- 28 CONGRESS SEEMS** to be close to a vote on digital signature legislation.

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- WORKSTYLES**
- 56 WINNEBAGO** Industries, a motor-home manufacturer, finds hiring IT workers at its rural Iowa offices challenging.
- 58 B-TO-B EXCHANGES** offer firms several advantages, but there are also obstacles.
- 61 THE BEST PLACES** to work, determined by a *Computerworld* survey, are revealed.
- QUICKSTUDY**
- 72 UCITA HAS WON** approval in a couple of states, but controversy still surrounds the software licensing and contracts bill.

TECHNOLOGY

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- 79 TIVOLI SYSTEMS** says companies that use its new Tivoli Device Manager can manage handheld devices running the Palm operating system through the company's framework software.
- QUICKSTUDY**
- 84 THE VIRTUES OF** Wireless Application Protocol and Web clipping are being debated as demand grows for handheld wireless Internet access. Learn more about both topics this week.
- FUTURE WATCH**
- 85 COMPUTING AGENTS** and "bots" are radically increasing their value by communicating with one another, and they will significantly affect business processes in the near future.
- 86 SOME ENTERPRISE** customers are finding that it's more cost-effective to buy an off-the-shelf portal package than it is to build the necessary tools themselves. The question is how well they do the job.

Landing three busloads of consultants in a building and setting them up for two years is not a winning proposition.

KEVIN COSTELLO, MANAGING PARTNER OF THE DIGITAL MARKETS PRACTICE AT ARTHUR ANDERSEN LLP, ON INTERNET PROJECTS, WHICH SHOULD BE SHORT AND INTENSE, NOT LIKE YEARS-LONG ERP IMPLEMENTATIONS. SEE PAGE 58.

OPINIONS

- 32 MARYFRAN JOHNSON** says IT leaders must flex their muscles in the area of online consumer privacy — before Washington beats them to it.
- 32 DICK HUDSON** speculates on the possibility that a "techie" like Scott McNealy of Sun Microsystems could succeed the legendary Jack Welch

as CEO of General Electric.

- 33 DAN DRAKE** wonders if software buyers are partly to blame for the mess in which Microsoft finds itself.
- 36 JOHN GANTZ** believes a coming shortage of electronic-business professionals will eclipse the IT skills shortage.
- 36 BILL LABERIS** has a message for the powers that be in

Congress: Allow Internet commerce to be taxed. It's only fair.

- 56 PAUL STRASSMANN** questions whether General Motors' move into information-based services will deliver more profit.
- 122 FRANK HAYES** speculates on the "worst-case scenarios" for IT should Microsoft be split in two.

AT DEADLINE

More Linux Layoffs

TurboLinux Inc. in Brisbane, Calif., last week became the third high-profile Linux company in a month to announce job cuts. The company wouldn't say how many jobs were cut but denied earlier reports that they involved "at least 50%" of the staff in several departments. Two days later, Chairman and CEO Cliff Miller relinquished his CEO duties to company President T. Paul Thomas.

Last month, LinuxCare Inc. in San Francisco canceled its initial public offering and announced unspecified job cuts. Corel Corp. in Ottawa, which has been restyling itself as a Linux company, also is expected to cut several hundred jobs as part of a restructuring under way since it received financing from Canaccord Capital Corp. in Vancouver, British Columbia.

Frequencies Approved

International road warriors can look forward to development of inexpensive global mobile phones, thanks to decisions reached at the International Telecommunication Union (ITU) World Radio Conference in Istanbul, Turkey, which ended Friday. Delegates to the ITU approved three new frequency bands for global mobile use, though one band is currently allocated in the U.S. for "last-mile" fixed wireless service by companies such as MCI WorldCom Inc.

Gail Schoettler, head of the U.S. delegation, said the Federal Communications Commission will study how to accommodate fixed and mobile operations in the 2.5-GHz band. Schoettler said the U.S. "got everything it wanted and more" in terms of new frequencies for the Global Positioning System, used by the transportation industry to track everything from trucks to ship containers, including new frequencies for civil satellite users that will provide better accuracy than the current 10-meter resolution.

Boo.com's Domain, Brand Names Sold

The liquidation of Boo.com Group Ltd. was completed last week with the sale of the London-based online retailer's domain and brand names to a New York fashion portal, Fashionmall.com. Boo.com folded two weeks ago.

Metro Networks Cut Costs, Complexity

Emerging technology enables customers to run Ethernet over MANs for the first time

BY JAMES COPE

INSTEAD OF leasing high-speed phone lines for thousands of dollars per month, Matt Kesner chose a metropolitan-area network (MAN) based on Ethernet standards running over optical fiber.

Kesner, CIO at law firm Fenwick & West LLP in Palo Alto, Calif., is among the first people to use an emerging infrastructure that promises to bring more bandwidth, lower costs and easier connectivity to companies lucky enough to have unused fiber running by their buildings. He uses a MAN — a high-speed network that covers a geographic area such as a city or suburb — to connect the law firm's offices in San Francisco and Palo Alto.

While MANs have been used for years, some of the biggest names in technology are investing billions of dollars to allow customers to use them for the first time at relatively low prices and on common standards such as Ethernet.

Just last week, Lucent Technologies Inc. in Murray Hill, N.J., announced that it would buy Chromatis Networks in Herndon, Va., for \$4.5 billion (see story, page 30). With the deal, Lucent gets Chromatis' technology for increasing performance in MANs.

And Nortel Networks Corp. in Brampton, Ontario, has announced its Optera line of MAN products.

Dark Fiber Used

But some users aren't waiting for these products and are getting MAN service from providers such as Yipes Communications Inc. in San Francisco and Telseon Inc. in Denver. Both companies purchase existing dark (unused) fiber and use it to create Gigabit Ethernet MANs.

"We were using four T1 lines from a local telephone company," Kesner said. "We were

spending thousands a month; we've reduced that to about \$1,000."

It took 10 days to set up the MAN, Kesner said, compared with the eight months it took the local telephone company to install a separate circuit to handle voice traffic.

Another early adopter is Philip Kwan, an associate director of network infrastructure at Incyte Genomics Inc., a biotechnology research firm in Palo Alto, Calif.

Kwan said Incyte had an optical fiber Gigabit Ethernet on its main campus but it needed to send hundreds of megabits of data to remote sites where its e-commerce applications are hosted and it needed to manage those applications remotely. "If we were using a telco to manage these boxes, it wouldn't be possible," he said.

Tom Jenkins, director of consulting at TeleChoice Inc. in Boston, said the use of such MANs may be limited because most unused fiber is in downtown areas, not suburbs.

Yipes spokesman Jonathan Marshall said he disagrees. "There's a lot of dark fiber out

Lawsuit Pits Copyrights Against Third Parties

Legacy software changes contested

BY JAIKUMAR VIJAYAN

An obscure 6-year old lawsuit that moved into the verdict phase last week starkly highlights the challenges — and costly options — corporations face in maintaining aging enterprise software.

At issue is the question of how far third-party service providers can go to maintain legacy software packages for their customers without violating the copyright of the original software vendor.

Involved in the dispute are two relatively unknown software vendors: Toronto-based Geac Computer Corp., and Parsippany, N.J.-based mainframe consultancy Grace Holdings Inc. Both have been slugging it out in a federal court in New Jersey since 1994.

Geac claims that Grace broke copyright laws by modifying Geac's mainframe software while providing third-party software maintenance services to customers.

In the suit, Geac claims that the code modifications made by Grace and its customers went well beyond the standard

tweaks often performed by companies that want to customize mainframe software to their environments.

Grace, which specializes in maintaining legacy software, in turn claimed that Geac was illegally using its copyright to prevent customers from hiring less-expensive third parties to service Geac software.

The dispute illustrates the kind of tangle users can get into when dealing with aging enterprise software in the absence of long-term contractual safeguards, said David Ochroch, a consultant at Reiner Associates Inc. in San Rafael, Calif.

"The ability for a company to bring in [an outside consultant] to modify a vendor's source code has to be negotiated up front," Ochroch cautioned.

Otherwise "software modification by third parties brings up copyright and derivative work issues," he said.

Aging Software in Dispute

The software in dispute was aging mainframe accounting packages originally sold by a company called McCormack & Dodge and then later by Dun & Bradstreet Software. It was D&B Software that first filed

AT A GLANCE

What's a MAN?

Features of a metropolitan-area network (MAN):

■ Connects buildings in the same metro area and on large campuses

■ Generally runs on existing public infrastructure, such as unused optical fiber that is leased or owned by a MAN service provider

■ The newest breed of MAN uses Ethernet standards for seamless connection to companies' LANs

there. Energy utilities, municipalities and carriers have buried it. You just have to know where it is."

Analyst Peter Sevcik at Net-Forecast in Waltham, Mass., also said there's plenty of fiber available. If not, he said, new high-speed technologies such as dense wave division multiplexing and 10 Gigabit Ethernet could boost the bandwidth of the fiber that can be used. ▀

suit against Grace Consulting in 1994. D&B Software was acquired by Geac in 1997.

Medical Economics Co. decided to sign up with Grace because its services were far cheaper than those of D&B Software, said Nick Sanghvi, an accounts manager at the Montvale, N.J.-based company.

"We were paying between \$50,000 to \$60,000 a year in maintenance fees to D&B, and we weren't getting anything back in terms of new functionality," recalled Sanghvi. In contrast, Grace offered better service and functionality at around \$20,000, he claimed.

Atlantic City Electric Co. — now part of Conectiv, a \$3.1 billion utility in Wilmington, Del. — moved off D&B maintenance when it discovered that getting new functionality would mean a disruptive upgrade to a new version of the software, said Burt Lopez, an account manager for planning and performance at Conectiv.

The company didn't want to pay for a reinstallation and decided to maintain the software it had through Grace because it was cheaper, Lopez said.

A Geac spokesman said the company only would comment after the verdict was announced. ▀



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Users Start Wrestling With Sun's Java 2 Spec

Six months after release, many take gradual approach

BY LEE COPELAND
AND CAROL SLIWA

SUN MICROSYSTEMS Inc.'s Java 2 Enterprise Edition (J2EE) specification was set in stone last December. But some users said they're just starting to grapple with how to implement the new development environment.

Cleveland-based drivetrain and engine component maker Eaton Corp. will keep its Java order-entry applications in their current nonstandard forms rather than migrating them to J2EE.

Chicago-based Bank One Corp. is implementing pieces of the specification it needs the most, with plans to add more in the coming months.

Mark Johnson, a vice president at Bank One's commercial division, said a team of 20 developers has been implementing the J2EE specification for servlets, JavaServer Pages (JSP) and Java Database Connectivity (JDBC). The next step will be Enterprise JavaBeans (EJB) and Java Message Service (JMS).

Premium-coffee kingpin Starbucks Corp. in Seattle designed a flexible application architecture to make it easier to plug new J2EE elements into its Web applications.

"Most of the work that we've done will be portable," said Michael Marshall, lead application architect at Starbucks. "We've structured [our applications] so that we could make changes, and the changes would only be in specific areas like the EJB or the JDBC abstract."

These examples illustrate the choices companies face

with enterprise Java application development. They can use a limited set of elements and swap them out when possible, conduct a costly wholesale migration or continue to use old and new versions of Java.

J2EE, a set of specifications for building server-based Java applications, includes the EJB components; JSP, for displaying dynamic content in Web pages; and Java servlets, which are server-side Java components that perform functions such as gathering data from a database.

J2EE also includes interfaces to provide database access, transaction processing and other functions.

Sun hopes the J2EE set of specifications will make it easier for developers to write Web-based applications that will run on a wide range of server products. Most major

vendors have said they intend to support the specification.

"The J2EE spec is good because it takes a set of technologies and forces vendors to bend to support it, which in turn makes development easier in the future," said Clayton Ferguson, a project manager at Eaton. "But chances are that most of our Java apps will continue to run unmodified [with nonstandard code], even if we need to use separate machines to host those applications."

Meanwhile, many customers will adopt parts of the stan-

dard as they need them.

"Everyone wants to do JMS, EJB and JDBC, because they are the core [application programming interfaces]," said Carl Zetie, an analyst at Giga Information Group Inc. in Cambridge, Mass.

Steve Garone, an analyst at International Data Corp. in Framingham, Mass., said interest in the various elements of J2EE now varies based on customer needs. But for users developing enterprise applications, eventually "all the specs will come into play," he said. ▀

What's Brewing in the New Java?

Core components of Sun's Java 2 Enterprise Edition spec:

EJB: Enterprise JavaBeans – The software architecture used to build server-based Java applications. It's often called the container layer because it provides a consistent interface to applications, regardless of server type.

JSP: JavaServer Pages – HTML pages with embedded Java source code that gets executed on a Web server or application server, which provides a way to display dynamic content on a Web page.

JDBC: Java Database Connectivity – The programming interface that allows Java applications to access databases using SQL.

JMS: Java Messaging Service – The programming interface that allows Java programs to message middleware systems.

Sun Revises Community Process

Responding to concerns from key Java stakeholders, Sun Microsystems plans to announce revisions to its community process for developing new Java technology.

The upgraded Java Community Process (JCP 2.0), to be unveiled at this week's JavaOne Conference in San Francisco, calls for an executive committee to determine which new technology proposals will move forward for further development among working groups. In the past, that decision-making power rested with Sun.

"We're looking for a way to give the community a level of assurance that we're [going] to keep the playing field level and allow others to participate in the process," said George Paolini, adding that the new setup loosely resembles the balance of power in the U.S. government. However, Sun will remain "steward" of Java technology and retain ultimate "veto power" on any changes to the virtual machine, the language and major additions to the platform, he said.

For at least one major Java

vendor, that's still too much control in one company's hands.

"While there have been some baby steps improving the JCP process, the bottom line is [Java] still is not an open standard," said Scott Hebner, director of electronic-business marketing at IBM, which has balked at licensing Sun's Java 2 Enterprise Edition. "We believe strongly – as originally committed by Sun – that Java ought to become an open industry standard. By definition, an industry standard is not controlled by a single company."

Last year, Sun abandoned two separate efforts to standardize Java through independent bodies – one through the International Standards Organization and the other through ECMA.

Instead, Sun has continued to tweak its community process for developing Java specifications. The newly appointed executive committee includes IBM, Hewlett-Packard Co., Apple Computer Inc., Compaq Computer Corp. and Oracle Corp. The first general executive committee elections are slated for this fall. – Carol Sliwa

New Sun Tool May Revive Interest in Client-Side Java

BY CAROL SLIWA

Vendors revamping their server products to support the latest enterprise Java technology won't be the only companies making news at this week's annual JavaOne conference in San Francisco.

The company hosting the show, Sun Microsystems Inc., will unveil a new product that could revive interest in Java on the client. The company's WebStart, which will be available this year, will provide a mechanism for downloading and caching Java applications.

Right now, users typically have to execute a Java applet each time they visit a site. With WebStart, they will be able to click and download the Java application only once.

WebStart is based on Java Network Launcher Protocol, which makes sure the user has

the correct Java virtual machine (JVM) needed to run an application. If the user's machine doesn't have it, the JVM is downloaded from a server along with the application, according to a source familiar with the product.

Many developers have shunned client-side Java work because of slow performance and uneven support for critical Java technology in browsers.

"This addresses some of the [performance] issues people had in deploying client-side Java," said Steve Garone, an analyst at International Data Corp. in Framingham, Mass. "We're going to see more interest in Java on the client" as use of products that try to work around browser-based Java problems increases, he said.

Although WebStart will address some issues, some com-

panies may still be reluctant to use client-side Java.

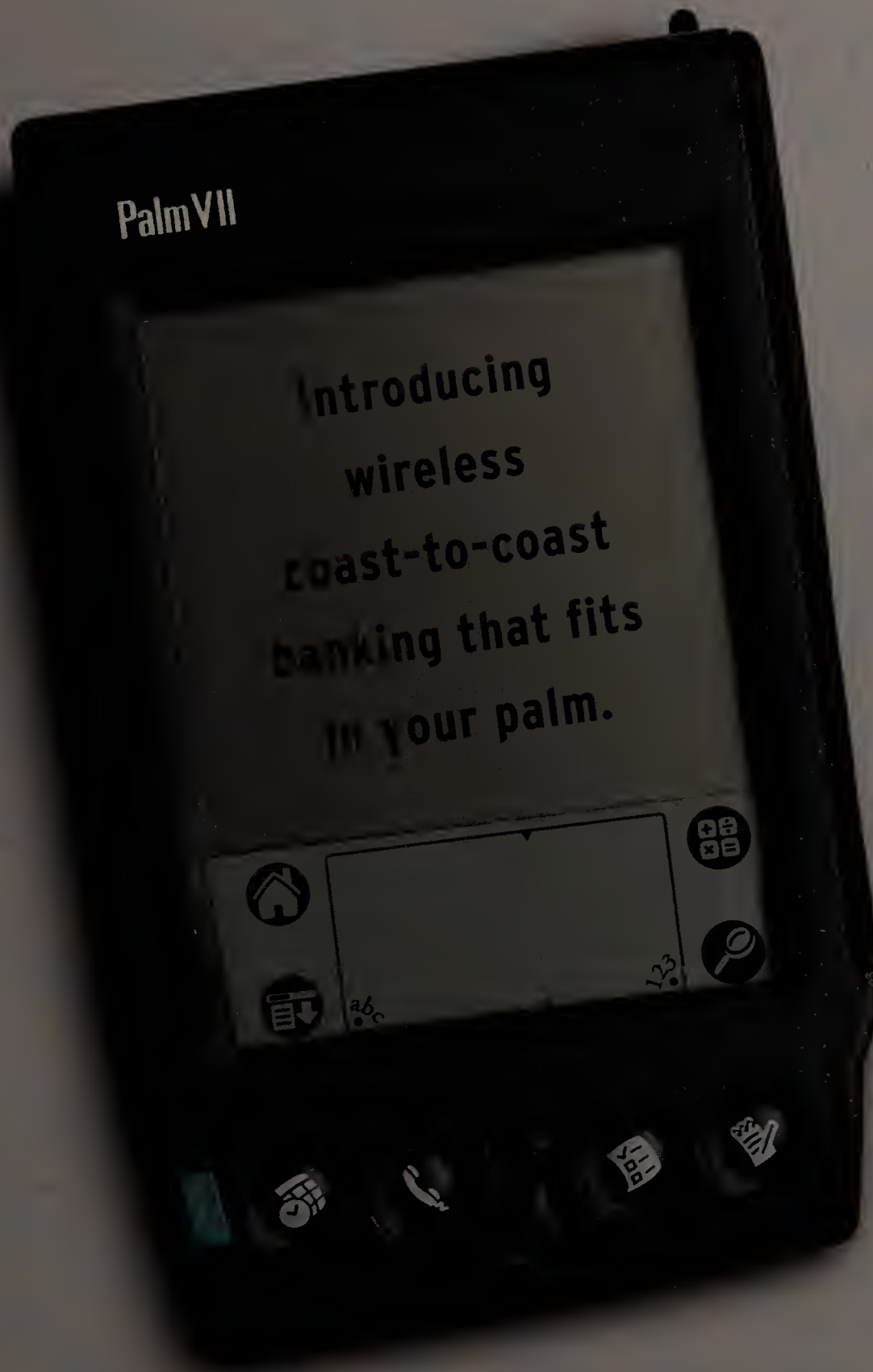
"WebStart [may] solve the performance issues of loading classes, but not the firewall issues that some corporations are uncomfortable with," said Kas Naderi, CIO at MunicipalTrade.com in Atlanta. He noted that some companies don't permit their employees to download Java.

Naderi said his company plans to use server-based Java in setting up its electronic marketplace for municipal bonds but plans to use only HTML, JavaScript and perhaps JavaServer Pages to meet its client needs.

In other news at JavaOne, IBM plans to announce a tool set, WebSphere Business Components and Enterprise JavaBeans components that aim to speed development of Web applications. Component target areas include supply-chain and customer relationship management in financial services and other industries, a company spokesman said.

WebSphere Business Components will ship this year. Early versions are available on IBM's alphaWorks Web site. ▀





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BRIEFS

Top 10 Internet Threats

The SANS Institute released a list of the 10 most critical Internet security threats to information technology workers. They include vulnerable Common Gateway Interface programs, application extensions installed on Web servers and overflow weakness in sendmail.

SANS also posted the five worst security mistakes committed by users, such as opening unsolicited e-mail attachments without verifying the source. More information about these lists can be found at www.sans.org/topten.htm.

Online Sales Edge Up

The Department of Commerce said online commerce sales rose 1.2% in the first three months of this year to \$5.26 billion, from \$5.198 billion in the fourth quarter of last year. However, online sales represented only 0.7% of \$747.8 billion in overall retail sales during the first quarter. This is the second time the Commerce Department has released estimates of online retail sales.

Study: People Won't Pay for Online News

Fifty-five percent of people who use the Internet would be unwilling to pay for online news services, according to results of a study by InsightExpress LLC in Greenwich, Conn. Of the 300 respondents to the survey, 27% go online for local news, 27% for world news, 25% for national news, 8% for sports news, 5% for business news and 5% for financial news.

Nasdaq Stocks Start Trading in Hong Kong

In a pilot program that started last week, seven Nasdaq stocks - Amgen Inc., Applied Materials Inc., Cisco Systems Inc., Dell Computer Corp., Intel Corp., Microsoft Corp. and Starbucks Corp. - began trading on the Stock Exchange of Hong Kong. As a result, it will become less expensive for Hong Kong traders to buy and sell these stocks, which will be traded in Hong Kong dollars. The stocks will continue to be listed and regulated on the Nasdaq Stock Market in the U.S.

Dot-com to Offer Direct Link to Travel Suppliers

Will charge corporate clients lower fees than middlemen

BY MICHAEL MEEHAN

LOOKING TO slice into the market dominated by established computer reservations systems, GetThere.com Inc. plans to launch a network this summer that will connect corporate customers directly to major airlines, hotels and car rental agencies.

By de-emphasizing the role of the middleman, GetThere hopes to charge lower transaction fees and undercut much of the business that currently flows through Sabre Holdings Corp., WorldSpan LP, Amadeus Global Travel Distribution and Galileo International reservation systems. Those companies didn't return phone calls by press time.

Menlo Park, Calif.-based GetThere has already signed up United Air Lines Inc., Northwest Airlines Inc., Trans World Airlines Inc., Marriott International Inc., Radisson Hotels & Resorts, Starwood Hotels & Resorts Worldwide Inc., Avis Rent a Car Inc., Budget Rent a Car Corp. and The Hertz Corp. for its supplier network.

GetThere will put those suppliers on a business-to-business network with major corporate clients such as Xerox Corp. in Stamford, Conn., Lucent Technologies Inc. in Murray Hill, N.J., and Nike Inc. in Beaverton, Ore., allowing buyers to get information directly from vendors.

Six-Figure Savings

"Reducing agency fees will save at least six digits on our travel spending," said Pam Moll, a travel services manager at Xerox in Rochester, N.Y. "And that's just by booking online rather than going through the traditional channels."

Steve Jett, Minneapolis-based Northwest's manager of e-commerce marketing, said many corporate customers have approached the airline

seeking such connections.

"Everyone thinks this is going to reduce distribution costs, and if they want to go through a direct solution, we have to meet that need," he said.

The idea is hardly a new one - e-Travel Inc. in Waltham, Mass., for example, offers companies direct connections to Delta Air Lines Inc. and Continental Airlines Inc. But Jett said, the vast majority of Northwest's business still flows through traditional computer reservations systems.

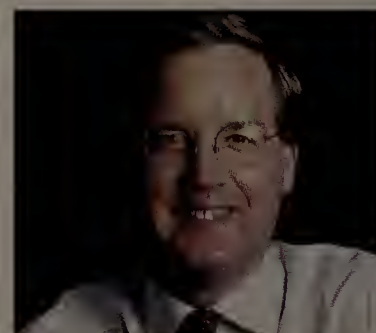
"There's a lot of start-ups surfing on the edge, looking to do this sort of direct stuff. But GetThere is the first in this particular segment we think has a lot of legs," said Scott Bush, vice president of sales and distribution at St. Louis-based TWA.

He said that direct bookings could contribute "hundreds of millions" to TWA's revenue over the next decade and that GetThere's client list of "mar-

quee names" helped persuade the airline to join the network.

"Their product opens doors for a small carrier like TWA it may not have been able to open for itself," Bush said.

GetThere's corporate client list should draw more suppliers into the mix, said Kate Rice, an



JEFF PALMER: GetThere is "leading the industry down a new path"

online travel analyst at Sherman, Conn.-based PhoCusWright Inc.

"The one advantage the [computer reservations systems] have had over the Internet is their collection of major suppliers in one marketplace.

[GetThere's Supplier Network] really poses a challenge to that," she said.

"Once these folks have tested the waters and reported back as guinea pigs that all is fine, you can expect more will follow," said Henry Harteveldt, an analyst at Forrester Research Inc. in Cambridge, Mass.

Jeff Palmer, GetThere's vice president for strategic development, said his company will need to be aggressive in continually improving its services once the network launches.

"We certainly think this is the first wave, not the total," he said. "Functionality and scalability will be keys for us."

Palmer noted that the use of XML standards in the travel industry and general business community helped make the integration of suppliers and users a much easier task.

Harteveldt said GetThere and e-Travel "are definitely leading the industry down a new path."

"But the [computer reservations systems] are huge organizations. They won't take this lying down," he added. "We'll have to see how they respond and how they try to add value when someone else has come up with a cheaper model." ■

Oracle Completes 11i Suite

But need to upgrade across board puts users in no hurry

BY CHRISTINE MCGEEVER

Oracle Corp. customers have been slow to follow the company's exhortation to run their businesses online, and last week's completion of Oracle E-Business Suite Release 11i appears unlikely to motivate many more of them.

The final modules in the suite are an order management application that enables orders to flow from customer operations through the supply chain by interoperating with other Oracle applications, such as Telesales and iStore, and a customer relationship management application.

However, the product suite has a built-in obstacle because current customers can't upgrade one element without

also upgrading several others. For example, 11i applications run only on Release 8i of the Oracle database, released earlier this year. But many customers continue to run a vintage, character-based version of the Oracle Release 10.7 application suite on early versions of the database.

One such company is Integrated Measurement Systems Inc. in Beaverton, Ore. It doesn't want to be among the first to upgrade to the Web-based applications, but it does plan to start testing the software this summer, according to information technology director Jeffrey Thompson. "We'll embark on the project early next year," he said.

Oracle acknowledged widespread use of Release 10.7 late last year, and said it would continue to support the suite through 2001 rather than remove it from active support this year. Thompson described

Oracle's support as "transitional," meaning Oracle addresses only "critical bugs," leaving the customer to solve less severe problems.

Gary Hensley, director of IT at Odwalla Inc. in Half Moon Bay, Calif., said the natural juice drink maker is in a better position than established Oracle customers because Odwalla is replacing a non-Oracle system with 11i applications on the 8i database. The company started loading Release 11i financials last week and expected to complete that installation today, thanks to an autoinstallation feature that "saves days of time," Hensley said. The "front-to-back" Oracle implementation is replacing a custom application that uses Microsoft Access and Excel.

Hensley estimated Odwalla's transaction volume to be about 1,000 orders per week entered by mobile sales associates using mobile wireless input devices and about 200 orders per week from on-site customer service representatives. ■



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Forget ERP; IT Dollars Shift to Customer Apps

BY JULIA KING
PHOENIX

For the next five years, large companies will spend a hefty

portion of their information technology budgets on best-of-breed software and projects designed to streamline supply

chains and manage customer relationships, according to Boston-based AMR Research Inc.

The Internet is driving com-

panies' attention away from back-office systems and steering them in this new direction, said analyst Rod Johnson at last week's AMR conference for IT executives here.

"The focus is on e-business,"

he said. "The underlying priorities of IT organizations have changed."

Between now and 2004, purchases of supply-chain and customer relationship management (CRM) software are likely to grow 35% to 40% annually, reaching a combined total of more than \$40 billion, AMR analysts said.

On the other hand, sales of enterprise resource planning (ERP) applications, such as SAP AG's R/3 software, will slow significantly, AMR predicted. ERP purchases are expected to grow by just 5% per year, according to AMR's survey of 1,400 software vendors and representatives from 1,000 companies across 13 industries.

William Irons, CIO at Lowe's Cos. in North Wilkesboro, N.C., said his company fits the AMR profile of moving to customer-facing activities.

Lowe's, a \$20 billion home improvement retailer with 589 stores, is testing an Internet-based "hub" where its smaller suppliers can retrieve electronic purchase orders and enter invoices.

The targeted suppliers, such as local nurseries that supply garden plants, often don't have electronic data interchange capabilities, so they fax a combined total of 30,000 invoices each week to Lowe's, Irons said.

"But if we set them up on the Internet with a browser-based interface, they can send invoices and we can send our purchase orders to a Web site," Irons added.

Lowe's is testing the system with 10 suppliers and eventually may migrate even its largest suppliers to the same hub. Such a move could save individual suppliers as much as \$3 million to \$5 million per year in value-added network charges, Irons said.

Life Fitness, a Franklin Park, Ill.-based manufacturer of exercise equipment, just spent about \$2 million implementing an extranet for its dealers, who can receive a better discount for placing their orders online. They also get direct access to in-depth product and customer information.

"Our philosophy is that the company that will win is the company that is easiest to do business with," said Augie Nieto, president of Life Fitness.

It's a philosophy that's already paying off, he added. ▀



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Amazon Deal Boosts HP's Standing in Dot-com Market

Jeff Bezos says HP offered 'best package'

BY JAIKUMAR VIJAYAN

HEWLETT-PACKARD Co.'s continuing bid to be recognized as a major Internet player got a boost last week when Amazon.com Inc. signed HP as its primary server supplier.

As part of the agreement, HP will provide more than 90% of Amazon's technology requirements during the next 18 months, said Jeff Bezos, CEO of Seattle-based Amazon. The deal covers a wide range of Unix, Linux and Windows NT servers as well as software and integration services.

Neither company disclosed financial details relating to the agreement. But HP CEO Carly Fiorina said during a press conference that Amazon has become one of HP's top five customers worldwide.

In a companion deal announced at the same time, HP

will become an "anchor tenant" in Amazon's electronics store. This means HP products will be prominently featured and promoted on the site, which reaches an estimated 20 million consumers, an HP spokeswoman said.

The deal announced last week expands an existing relationship between the two companies.

Last fall, Amazon purchased HP's high-end V-class Unix servers to power its main e-commerce applications during the critical holiday season.

Amazon will migrate from its Compaq Computer Corp. and Sun Microsystems Inc.

platforms to HP's technologies over the next 18 months, Bezos said.

"There was nothing wrong with these [technologies]. HP had the best package," Bezos said when asked why Amazon chose to move to HP products.

Amazon represents a major win for HP, a \$50 billion corporation that, like other systems vendors, has been trying to

make a dent in Sun's dominance in the dot-com market.

Last month, for instance, Sun warded off both IBM and HP to retain its contract as prime supplier to eBay Inc.

"Everybody is really competing for the Internet infrastructure business," said Kelly Spang, an analyst at Technology Business Research Inc. in Hampton, N.H.

"Amazon has got a lot of marquee value for HP," said Laurie McCabe, an analyst at Summit Strategies Inc. in Boston. "It's bound to get HP noticed among other dot-coms, especially in situations against Sun." ■

Palm Ties Handheld, Enterprise Applications

Software lets users synchronize devices

BY BOB BREWIN

Palm Inc. last week extended its reach into enterprise computing with the introduction of synchronization software designed to link handheld devices with corporate information systems.

Palm said its HotSync Server

software allows for centralized management of handheld computers and applications. It also enables synchronization with enterprise groupware.

The software will initially support Palm handhelds, but the Santa Clara, Calif., company said it expects to add support later this year for devices based on Microsoft Corp.'s Windows CE operating system, including the Pocket PC introduced in April.

Analysts welcomed the arrival of the software, which they view as essential for corporate information technology managers in an era of increasingly mobile computing.

Christopher Fletcher, an analyst at Aberdeen Group Inc. in Boston, said Palm's synchronization software marks the coming of age of handheld devices. Once viewed as annoyances by corporate IT departments, they're now thought of

as useful tools that need to be centrally managed in order to harness their power, he said.

"This gives [IT managers] the tools they need to manage these devices at the network level," Fletcher said.

But according to some analysts, Palm's focus on the Palm operating system and Windows CE is too narrow.

Bob Egan, an analyst at Gartner Group Inc. in Stamford Conn., called synchronization software "one of the most critical new platforms" for IT managers. But he said such software needs to be "device-independent."

Grif Coleman, product manager for enterprise solutions at Palm, agreed. "There probably is a set of IT managers who want to have a multivendor solution," he said. "But we believe there is an even larger set of managers who want to have a consistent, single-vendor solution to their problems."

Jason Menear, a Duluth, Minn.-based network administrator at satellite communications equipment design firm Vertex RS in Sterling, Va., was a HotSync beta user. Menear termed the software "simple and easy to install" on his Windows NT server.

"It's much like using an office e-mail system," Menear said. "[But] it's not as fast or as up-to-date because of the need to replicate."

HotSync will help users integrate Microsoft Exchange e-mail and the Exchange calendar with the Palm date book and mail applications.

HotSync Server has a base price of \$2,400, Palm officials said. ■

Group Tells FCC Net Use on Ships May Cause Problems

BY BOB BREWIN

A coalition of fixed wireless users claims that Internet-at-sea services launched over the past year by several cruise lines are a threat to public safety and the operations of critical infrastructures, such as railroads and oil pipelines.

The group, which includes the Association of Public-Safety Communications Officials International Inc., the Association of American Railroads, the American Petroleum Institute and the Fixed Wireless Communications Coalition, last month asked the Federal Communications Commission to revoke the experimental license it granted to a Miami company in 1996 to provide broadband Internet service to cruise ships.

The company — Maritime Telecommunications Network (MTN) in Miramar, Fla. — uses earth stations that operate on frequencies in the 6-GHz band, the same band used for fixed microwave communications by railroads, pipelines and police departments.

Andrew Kreig, president of the Wireless Communications Association International in Washington, which represents the fixed wireless industry, said signals from the terminals on the cruise ships could interfere with "vital" fixed wireless communications.

Eliot Greenwald, an attorney at Swidler Berlin Shereff Friedman LLP in Washington, called the petition "ill-advised."

In a filing to the FCC, Greenwald said, "MTN has been op-



CRUISE SHIPS that use the Maritime Communications Network to access the Internet may interfere with vital services, a coalition says

erating under an experimental license for many years, and there has not been even one case of suspected interference, not to mention demonstrated interference."

Greenwald said MTN had surveyed all fixed microwave links in shipping lanes in 17 U.S. ports, and even in the worst-case scenario, the MTN earth stations wouldn't cause any interference.

Glenn Farrington, CEO of Digital Seas International Inc.

in New York, which uses MTN, called the wireless organization's FCC filing a "bunch of malarkey." Farrington said he believes the effort will fail because the cruise industry has more clout with the FCC.

Revoking the MTN license would hit the cruise lines — which charge \$40 per hour for Internet access — in the pocketbook, Farrington said.

The FCC didn't return calls for comment on how it intends to deal with the request. ■

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BRIEFS

EMC to Unleash
McData in IPO

McData Corp., an EMC Corp. subsidiary, filed for an initial public offering (IPO) of up to \$100 million in Class B common stock with the Securities and Exchange Commission. McData intends to list with New York-based Nasdaq Stock Market Inc. under the ticker MCDT. EMC plans to distribute all of its shares of McData Class A common stock to its shareholders six to 12 months after the offering. Broomfield, Colo.-based McData develops computer network switches and software.

Microsoft Secures
E-Book Content

Microsoft Corp. has lined up 30 book publishers behind its Microsoft Reader electronic-book software, which features the company's ClearType font technology. More than 800 titles will be available for Reader when it ships this summer, Microsoft said.

Strange Webfellows

Voter.com Inc. is adding content from *The Nation* and *The National Review*, well-known journals on opposite ends of the political spectrum, for its election 2000 coverage. It also announced last month a co-branding campaign with Microsoft. The Washington-based Web site is sponsored by organizations that include Emily's List, The Sierra Club, the Christian Coalition and The American Conservative Union.

Short Takes

Internet services company **1STUP.COM CORP.** in San Francisco, an operating company of **CMGI INC.**, is rolling out more than 50 rack-mounted servers from **VA LINUX SYSTEMS INC.** to run application servers and an Oracle8i database on Linux. . . . **THE BOEING CO.**'s Space and Communications Division has announced it will acquire **AUTOMETRIC INC.**, a Springfield, Va.-based geospatial information technology software and services provider. . . . **PEOPLESOFT INC.** has named Sam L. Gallucci to head the company's customer relationship management division.

Microsoft, Slashdot at
Odds Over Kerberos

Copyright, open-source violations soar

BY ANN HARRISON

THE KERBEROS security protocol, which has been adopted by the Internet Engineering Task Force as an open standard, is the subject of an ongoing dispute between Microsoft Corp. and the Slashdot.org Web site, which hosts discussions about open-source software.

Microsoft claims that a Slashdot discussion thread that posted Microsoft's proprietary extensions to the open-source Kerberos protocol violates Microsoft's copyright and is illegal under the Digital Millennium Copyright Act (DMCA).

However, "Microsoft is in no way trying to limit industry dialog on this topic," said Microsoft spokeswoman Luisa Vacca.

Members of the Slashdot community argue that Microsoft is attempting to stifle free speech within the open-source community.

The Kerberos security protocol, which was designed at MIT in the 1980s, is used in Windows 2000 in a form that is partially incompatible with widely used versions of the standard. To read Microsoft's version of the specification, developers have to run an executable file that compels them to agree to a confidential licensing agreement. This angered some visitors to Slashdot, which posted instructions that tell users how to download the specification without having to agree to the restrictive licensing agreement.

On May 10, Microsoft attorney J. K. Weston fired off a letter to Acton, Mass.-based Andover.net, which publishes Slashdot, demanding that the instructions be removed.

"That entire mentality is completely against the whole open-source objective. Microsoft just doesn't get it," said Dean Williams a network engineer at Yesmail.com, a Chicago-

go-based permission e-mail marketing company that uses Windows 2000. "You can charge money for anything that you add to open-source, but you have to make the source code available to anyone who wants to use it."

Slashdot editor in chief Robin Miller refused to delete the 11 messages that Microsoft insists are illegal under the DMCA. Instead, Slashdot shot back with a letter from its attorney, Mark D. Robbins, questioning Microsoft's legal claims. Robbins said Andover.net is concerned about deleting the user postings "given their apparent relevance to issues in the current antitrust litigation between the Microsoft and the government."

Microsoft appeared to be backing down from the dispute last week.

"Was Slashdot the right bat-

tle to pick? Maybe, maybe not," said Adam Sohn, public relations manager for Microsoft's inside platforms division. Sohn said the letter drafted by Robbins disregarded Microsoft's copyright concerns, but he declined to comment on whether the company would continue to pursue Slashdot on alleged copyright violations.

According to Microsoft, the Kerberos licensing agreement was put in place to protect Microsoft's intellectual property on the use of an undefined data field left open for Kerberos Version 5.0, which allowed developers to store authorization data for the Windows 2000 operating system.

"That field was set out by the framers of the standard for the special purpose of allowing vendors to put authorization data in it, so that was a space for innovation," said Sohn. "We felt we wanted to protect that innovation and that investment." ▀

Kerberos Copyright Conflict

Questions asked by Slashdot attorney Mark D. Robbins about Microsoft's Kerberos copyright claim:

? How can Microsoft claim trade secrecy for a protocol that is distributed over the Internet?

? What measures has Microsoft taken to protect the trade secrecy of its Kerberos specification beyond the use of a click-wrap license agreement?

? How could posting of the Microsoft Kerberos specification on Slashdot have any detrimental impact on the market for authorized distribution of Microsoft's version of Kerberos?

? Why shouldn't Slashdot users and the general public be able to view this protocol for purposes of commentary and criticism in light of its apparent relevance to issues in the government's antitrust litigation?

Continued from page 1

All-Star

com Inc. in Bellevue, Wash., which is in charge of this year's electronic tabulations.

"This site's high-profile and we know it," O'Mara added.

Online voting, which started in 1996, last year collected some 1 million ballots, according to MLB. Another 5 million or so ballots were submitted on paper.

This time around, ballots can be cast on the site <http://allstarballoting.seasonticket.com> until July 1. Fans will be allowed to cast 25 electronic ballots — an average of one for each home game during the balloting period — from a single e-mail address. The game is July 11.

All addresses will be verified, daily audits of the votes will be performed and the totals will be posted daily rather than in real time, to allow time for those audits to take place, O'Mara explained.

"We're confident [crackers are] not going to cast an illegal vote that gets counted," he said.

O'Mara said he believes the e-mail addresses will provide enough information to perform the needed security but refused to reveal details of how the process will work. "There are a few folks out there we'd just assume not know what we're doing," he said.

Last year, the culprit was caught when his votes came in too quickly from an identical IP address.

Outsiders' Doubts

Security experts aren't as confident as O'Mara that the new system will ward off crackers.

Setting up a program to delay the votes and randomize the IP addresses wouldn't be too difficult for an experienced cracker, said Rob Clyde, vice president for security management at Rockville, Md.-based Axent Technologies Inc.

"They can punch up a routine and just let it run for a few days," Clyde said.

Michael Rothman, executive vice president of Needham, Mass.-based security firm Shym Technology Inc., said the All-Star site will pose a ready-made target for "anybody who can sling together a Java script."

"Technology's amazing," he said. "It's bringing a level of efficiency in fraudulent activities that used to be done with just brute force."

Rothman said that Season-Ticket.com was on track in creating digital identification. Clyde also suggested using intrusion-detection software and keeping core activities behind an external firewall.

Yet baseball fans have tried to stuff All-Star ballots for decades. For example, fans in Cincinnati populated the entire National League roster with their hometown Reds in 1956. And for a cracker community that loves a challenge, the All-Star ballot is as tempting to swing at as a hanging curveball.

"We know somebody's going to try something," O'Mara said. ▀



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Techies to Get Peek at Next-Gen Windows

Analysts skeptical about impact of NGWS

BY DOMINIQUE DECKMYN

DESPITE THE delay of Microsoft's much-anticipated Next Generation Windows Services (NGWS) rollout, developers are likely to hear some new details about the company's plans this week. Industry analysts are hinting that NGWS may turn out to be less than it has been cracked up to be.

Microsoft Corp. had planned to unveil NGWS, its vision of Web-enabled software services, last week. But the event

was pushed back to June 22, officially because a decision in the company's antitrust case could overshadow the rollout. But according to Steve Kleynhans, an analyst at Meta Group Inc. in Toronto, initial negative feedback from those who previewed parts of NGWS may have contributed to the delay.

However, at this week's Tech Ed event in Orlando, Chairman and Chief Software Engineer Bill Gates is expected to give his keynote on NGWS. But no sessions on it are planned.

Technical sessions are planned on established Microsoft product lines such as Exchange 2000 and COM+. "It's really hard for these developers to follow Microsoft's lead if [it isn't] saying anything," said Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass.

NGWS is Microsoft's plan for transforming its various software products into services that can be offered on the Internet. These services will be accessed from various devices using the standard XML protocol, but Microsoft executives have hinted that Win-

dows-based PCs will offer a richer interface to the services.

So far, information about NGWS has been so fragmented

Continued from page 1

Microsoft

But there still won't be hearings with witnesses. Legal experts said Microsoft's argument that due process has been shortchanged could be persuasive at the U.S. Court of Appeals, which is likely to get the case after Jackson.

In last week's filing, Microsoft provided a second list of witnesses it was prepared to call if Jackson had held full-fledged hearings on the government's breakup plan.

Jackson held a one-day hearing on the plan on May 24. But he refused to add more hearings with witnesses, saying at one point that the two-year trial had lasted long enough.

On Microsoft's proposed witness list were top executives of such heavy Windows users as retailer Nordstrom Inc., auto insurer Geico Corp. and entertainment company DreamWorks SKG. Microsoft

that "it could be anything, and it could be nothing," said Kusnetzky.

"Parts of this sound like a rehash of DNA 2000," said Kleynhans.

Last September, Microsoft announced Distributed Internet Architecture 2000 (DNA 2000) as its strategy for distributed Web applications. Many of the components of

DNA 2000, including SQL Server 2000 and BizTalk Server, have yet to ship.

If NGWS is a mere repositioning of existing products, it's still a momentous event, said Kleynhans. "This is on the level of what they did with the Internet in 1995, where they sat down and said, 'We have a lot of good products, but we have no real strategy,'" he said. ▀

AT A GLANCE

Tech Ed News

Among the Windows 2000 tools previewed or announced:

WinInstall 2000 (Veritas Software): A tool for distributing apps in mixed desktop environments, including Windows 2000

ActiveBatch 3.0 (Advanced Systems Concepts): Distributed job management and scheduling

ScriptLogic Professional Edition (ScriptLogic): Creates log-on scripts and other scripting

Patrol (BMC Software): New components will be demonstrated

ETrade, Ernst & Young Pair Up to Offer Financial Advice

Online advice-takers expected to hit 10M

BY MARIA TROMBLY

ETrade Group Inc. and Ernst & Young LLP have joined together to form a firm aimed at delivering personalized financial advice over the Internet.

The move will give ETrade access to the growing market for online financial advice, according to Rob Hegarty, an analyst at Needham, Mass.-based TowerGroup.

According to Hegarty, there

are currently 2 million online financial advice accounts in the U.S., a number expected to grow to 10 million by 2003.

With trading commissions down because of market worries, ETrade's entrance into the online financial advice space makes sense because the company needs to expand its revenue sources, said Linda Alt, an analyst at Gartner Group Inc. in Stamford, Conn.

The joint venture reflects how Menlo Park, Calif.-based ETrade is moving away from its pure electronic-business model, said Lehman Brothers

Holdings Inc. analyst Richard Repetto. Earlier this year, ETrade acquired Portland,

Ore.-based Card Capture Services Inc.'s network of 8,500 automated teller machines. It also recently purchased retail space in the Super Target department stores of Minneapolis-based Target Corp.

"These measures are a step in the right direction," said Repetto. "It's too early to determine their effectiveness and whether they will be accepted by retail investors."

ETrade current-

ly has an agreement with DirectAdvice.com Inc. in Hartford, Conn., to provide cus-

tomers personal financial advice online. However, that relationship will be phased out as a result of the new deal with Ernst & Young.

The new company is expected to launch early next quarter.

The financial advice will be provided through Ernst & Young's network of 1,000 financial planners using a tiered structure of varying costs and different levels of interactivity. ▀

appeals court in Washington.

Washington antitrust attorney Joe Sims said that there have been no glaring legal errors in Jackson's rulings but that reasonable people could differ on whether the remedy fits the violations and whether Microsoft had enough time to make its case.

Jackson clearly wanted to thwart the kind of delaying tactics that turned the IBM antitrust case that began in 1969 into a 13-year ordeal with 974 trial witnesses and 66 million pages of evidence. But the question will be, Did he go too fast?

John Flynn, a law professor at the University of Utah in Salt Lake City, said the appeals court will be highly skeptical that Jackson took enough time to determine whether a breakup would be effective and that it wouldn't harm consumers.

Flynn predicted that the appeals court will affirm the decision on antitrust violations but send the remedy issue back to Jackson for more work.

William Kovacic, a law professor at George Washington University in Washington, agreed. He said Jackson did a masterful job of balancing speed and careful analysis — until the remedies phase.

Kovacic said the judge could have bought "some relatively cheap insurance [against a reversal] if he'd given Microsoft a month to put on a show" with witnesses. ▀

Appeals Primer

Legal experts say a Microsoft appeal will take one of two routes

NORMAL PATH: Microsoft appeals to the U.S. Court of Appeals in Washington; the court sets a schedule for briefs and oral arguments and renders a decision; a subsequent appeal would go to the U.S. Supreme Court. If it took the case, it would accept briefs, hold oral arguments and issue a ruling. **Elapsed time:** two years, or more if portions of the case are sent back to the trial judge.

FAST TRACK: Either Jackson or one of the parties seeks a direct appeal to the Supreme Court, which then decides whether to accept the case; Supreme Court accepts briefs, holds oral arguments and issues a ruling. **Elapsed time:** one year, or more if portions of the case are sent back to the trial judge.

E-Partners

What they bring to the new, unnamed Internet-based financial advice company:

ETrade

- 2.6 million customers
- Internet experience
- \$25 million
- 50.1% ownership

Ernst & Young

- 20,000 customers
- 1,000 financial advisers
- 60 employees
- \$25 million
- 49.9% ownership



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CONTENT SECURITY. THE GOOD, THE BAD, AND THE UGLY.

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DID YOU HEAR THE E-MAIL JOKE ABOUT THE GUY WHO COST THE COMPANY MILLIONS?

The one about the tasteless joke some clown thought was funny. It wound up in an e-mail box that resulted in a \$2.2 million sexual harassment lawsuit.

The fact is, last year the Supreme Court ruled

companies are liable and responsible for inappropriate e-mail communications between employees, regardless of whether or not the company was aware of the communication.

And improper use of e-mail privileges not only leaves you vulnerable to lawsuits, it exposes you to loss of confidential, proprietary information. For example, employees who inadvertently send sensitive corporate



trade secrets and strategic documents like salaries or financial plans.

By scanning e-mail usage, you can monitor suspicious content and reduce e-mail volume, thereby boosting bandwidth.

SOME TEENAGERS HAVE AN EASIER TIME WRITING MALICIOUS CODE THAN GETTING DATES.

Some can be mischief-making 15-year-olds writing

malicious code. On the other hand, there are real ugly enemies out there.

Rogue employees and virtual terrorists bent on stealing company secrets, spreading malicious viruses, crashing servers, and potentially causing economic chaos.

If someone hates you, without intrusion detection they can electronically paralyze your site,

the streaming videos of sports highlights.

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Baan Is Rescued, but Users' Concerns Remain

Layoffs, integration with Invensys rouse skepticism amid firms' rosy promises

BY KATHLEEN OHLSON
AND JENNIFER DISABATINO

THE FATE of Dutch business software maker Baan Co. is now known, but that of its users is less certain.

After seven consecutive quarters of losses and leadership woes that saw four CEOs at the helm within 18 months, Baan last week was potentially rescued by Invensys PLC's offer to buy the company for 762 million euros (\$708.7 million). The deal is expected to close late next month or in early August, said Allen Yurko, CEO of Invensys, a London-based supplier of industrial automation and control products, during a conference call with analysts.

If the deal is consummated, Baan will be integrated into a newly created division called Invensys Software and System (ISS). According to Katrina

Roche, Baan's chief marketing officer, 1,000 jobs will be cut from ISS, with the bulk of the layoffs coming from the Baan side. Baan, which specializes in enterprise resource planning (ERP) and supply-chain software, currently has a workforce of 4,300.

Users and analysts questioned how the cuts and the ISS integration will affect Baan's products and support.

Craig Mey, vice president of manufacturing services at Phillips Plastics Corp. in Phillips, Wis., said he has followed Baan's financial woes with interest, hoping that the company would stabilize sufficiently to maintain and expand its product line. Mey, whose firm uses supply-chain modules as well as other Baan products, said he is still evaluating Invensys and noted that his initial impression is that the U.K. firm's products

Invensys' Acquisition

Invensys will buy Baan for 762 million euros (\$708.7 million) in cash.

The deal is expected to close in late July or August.

Baan will be folded into the Invensys Software and System (ISS) division. It will continue to be based in its current headquarters and will be run by Laurens Van der Tang, who is currently executive vice president of R&D at Baan.

The ISS division is expected to have annual sales of \$2 billion.

More than 1,000 employees of the ISS division will be laid off, most of them from Baan.

Invensys is looking to reduce Baan's costs by \$60 million to \$120 million per quarter by year's end. It will incur \$400 million in restructuring costs during the next 18 months as a result of the Baan acquisition.

complement Baan's offerings.

Keith Bearden, CIO at dental equipment maker A-dec Inc. in Newberg, Ore., said he's relieved that Baan wasn't acquired by another ERP company that might force Baan's installed customer base to switch to its software. "I'm not

ready for another ERP installation. It's too painful," he said.

Still, Bearden said he is uncertain about Invensys' plans for Baan, in light of the layoffs and its stated intention to cut costs (see chart).

Invensys said in a statement last week that it is com-

mitted to Baan's research and development program and its suite of products. Roche also stressed that Invensys "will continue with [Baan's] products and won't change the product direction."

But Bearden seemed unconvinced. "I have a lot of questions, and it's too early to tell," he said.

Above all, he wants Invensys to improve support, "because a lot of good people left," he said. Bearden noted that A-dec has gone through four Baan account representatives in 16 months.

Baan customers are relieved now, said Ed Markowitz, CEO of ChainNet Research AG in Cincinnati. But despite Invensys' assurances, customers are concerned about Invensys' plans to maintain Baan's existing products, Markowitz said.

Laurie Orlov, an analyst at Forrester Research Inc. in Cambridge, Mass., expressed some skepticism.

"There's still some hope Invensys will see an opportunity to re-energize Baan's suite as a viable alternative, but it will be hard because the company is being pulverized by downsizing," Orlov said. As a result, there will be "a blurred [Baan] brand, a terrified customer base, slice-and-dice employees and an alienated knowledge workforce," she said. ▀

Kit to Boost Fault Tolerance of NT Servers

Marathon claims 99.999% uptime

BY JAIKUMAR VIJAYAN

Marathon Technologies Corp. this week will introduce an enhanced version of its high-availability kit for Windows NT servers featuring new technology for tying dual-processor Intel Corp. servers into near fault-tolerant configurations.

Marathon's new Multiprocessor Endurance 6200 hardware and software technology will also allow Windows NT users to increase the geographical distance between their servers to 500 meters for better disaster tolerance. The tool kit will be priced at less than \$50,000 per kit.

Boxboro, Mass.-based Marathon has been trying to carve a niche for itself selling a patented technology called ComputeThru. The company claims ComputeThru delivers 99.999% uptime — or less than 5 minutes of downtime annually — on Windows NT server hardware.

Hewlett-Packard Co. will announce models of its NetServer systems this week featuring Marathon's new technology. HP has a reseller agreement with Marathon.

No Service Disruption

At a basic level, Marathon's approach involves tying four Intel servers together into one large, logical server array. The array is split into halves, with each half running the same application identically and in

lockstep with the other half. If one half of the array fails, the application keeps running on the other side, said Craig

ComputeThru Goes the Distance

Marathon's approach to high-availability Windows NT servers:

■ Four Intel servers are tied together into a single large logical server array

■ The array is split into two halves

Each half consists of two servers — a compute server and an I/O server

■ Network interface cards and patented synchronization software link the two halves and allow the same application to run identically on both halves at the same time

Jon Anderson, a director at Marathon.

The approach ensures that there is no single point of hardware failure, Anderson added.

It also ensures that there is no service disruption in the event of a hardware failure, said Denis Nothern, information technology director at Mothernature.com Inc., a Concord, Mass.-based online retailer.

"The fact that the [array] can continuously run and be fixed without taking the whole platform down is remarkable" when compared with other approaches, such as Microsoft's Windows NT clustering technology, Nothern said.

Availability to the Nines

It's the same reason First Options of Chicago Inc. is using Marathon's technology to run an important trading application, said Brian Slattery, manager of server support.

First Options is a provider of clearance and execution services to traders on major U.S. exchanges.

Unlike other high-availability techniques such as clustering, Marathon's approach doesn't allow for even a temporary service disruption if a server goes down, Slattery said.

"That's critical for us. ... A fail-over of even a minute or two could cause big problems" when dealing with trading applications, he said.

"Marathon is the only vendor offering five nines of system availability in the NT industry at this time," said Joe Clabby, an analyst at Aberdeen Group Inc. in Boston, referring to 99.999% uptime.

The new ComputeThru technology in Marathon's tool kit can be used to tie more scalable and powerful dual-processor Intel servers into similar configurations. ▀



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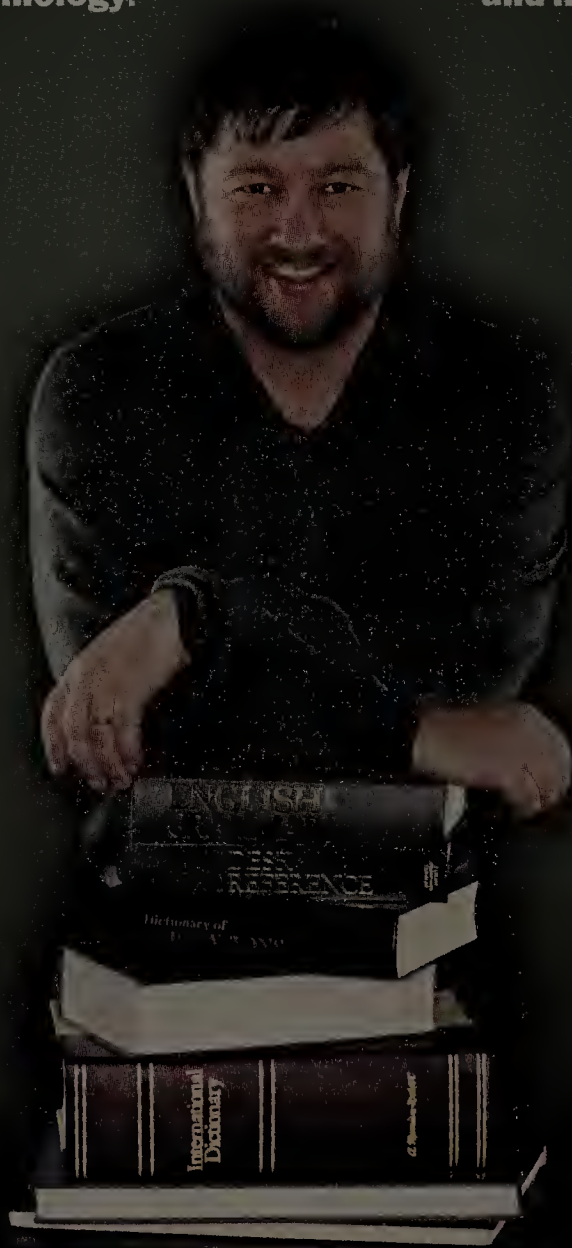
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Xerox Unit Farms Out Security in \$20M Deal

Axent contract will pay for itself through savings from doing business online

BY ANN HARRISON

XEROX EUROPE, the European arm of Stamford, Conn.-based Xerox Corp., has signed a five-year, \$20 million managed security services contract with Axent Technologies Inc. to secure Xerox's mobile workforce and its digital business initiatives.

Beginning this year with several thousand users, Rockville, Md.-based Axent, together with its subsidiary Secure Network Consulting Inc., will create an electronic security framework and service agreement that is expected to serve up to 100,000 Xerox customers and employees by mid-2002.

Xerox Europe, which had revenue of \$5.3 billion last year and employs 18,500 people, is expected to save \$20 million per year using its parent company's eCommerce secure electronic trading environment. The Axent deal will enable this use.

Increasing corporate initia-

tives for online commerce systems — combined with recent attacks on e-commerce sites and a shortage of trained security managers — has pushed the demand for outsourced security services.

David Tapper, an analyst at Framingham, Mass.-based International Data Corp., estimates that the market for security consulting should reach \$14.8 billion by 2003, up from \$6.2 billion last year.

Security Is Part of Reinvention

Managed security is a key part of Xerox's plan to reinvent itself from an analog copier business to a digital document and information technology company, according to Jim Lawler, senior director and general manager of Xpress, Xerox Europe's purchasing group. He said Axent's managed security services are the cornerstone of Xerox's plans to move its mobile European workforce, its field service engineers and its business-critical processes to the Internet.

"What Xerox is trying to do is create a seamless digital environment for customers, employers and suppliers," said Lawler. "Axent offered the best value for the money as well as robustness of environment."

Xerox plans to integrate the Axent security services into its eProcurement and eCommerce initiatives, which the company said will improve customer service, exchange or-

dovetail those in industry parameters and technical protocols. The system will extend from the customer's gateway into the Xerox network.

Lawler said Axent also offers a deeper understanding of European technical standards, enterprise resource planning systems, encryption and privacy regulations essential for his business.

Outsourcing Trend

Steve Hunt, an analyst at Giga Information Group Inc. in Park Ridge, Ill., said Axent is joining the ranks of security product vendors who have recently announced that they will offer security services

A Means to an End

Xerox Europe's outsourcing deal for security services is a key part of the company's plan to reinvent itself.

Value of contract: \$20 million

Duration: Five years

Business goals it will help Xerox accomplish:

- Electronically exchange orders, invoices and payments and automate manual legacy processes, improving fulfillment, delivery, logistics and financials.
- Move the company's mobile European workforce, field service engineers and business-critical processes and communications to the Internet.

ders from thousands of partners and automate manual legacy processes. Axent will gather information about Xerox's business practices and information management and

through outsourcing deals.

Others include Internet Security Systems Inc., Network Associates Inc., Aventail Corp. and Counterpane Internet Security Inc., he said. ▀

Security Hole Patched in Network Associates Firewall

Vulnerability occurs with dual tool use

BY TODD R. WEISS

Unix users of Network Associates Inc.'s Gauntlet firewall software are being advised to install a patch to protect their networks from a security hole that leaves them vulnerable to attack.

The security hole occurs when Gauntlet is used with Cyber Patrol software from El Segundo, Calif.-based Mattel Inc. The combination of the two applications causes a

"buffer overflow vulnerability," which creates an entryway for attacks on the network, Santa Clara, Calif.-based Network Associates said in its advisory.

Allison Taylor, a spokeswoman at the company's PGP Security division, which makes Gauntlet, refused to say how many customers use the program. But she did say no problems were reported due to the security hole.

"We've been monitoring our newsgroups and our support lines and [customer concerns were] very minimal," Taylor

said. The problem was detected May 19 and a patch was released May 22.

It's available at www.pgp.com/jump/gauntlet_advisory.asp#patches.

Eric Hemmindinger, an analyst at Aberdeen Group Inc. in Boston, said that because the company worked quickly to identify and create a patch for the security hole, it won't be

much of a problem for Gauntlet users. "We usually view that as a good thing" when a company responds immediately to fix product flaws, he said.

The patch supports Gauntlet for Unix Versions 4.2, 5.0 and 5.5. The patch also should be applied to Network Associates' WebShield 100 and 300 series products.

Users of Gauntlet for Unix

4.1 must apply a manual workaround procedure, outlined at Network Associates' Web site.

Cyber Patrol software is installed by default as part of the Gauntlet package, then is disabled after 30 days, according to SecurityFocus.com, a Web-based security clearinghouse that first reported the hole.

No other applications used with Gauntlet are known to cause a similar problem, said Dana Lengkeek, a Network Associates spokeswoman.

The default settings that install the Cyber Patrol trial as part of the Gauntlet package won't be changed because the available patch files fix the problem, Taylor said. ▀

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New Worm Fails to Make Big Impact

BY KATHLEEN OHLSON

Antivirus software vendors warned companies about another e-mail virus last week, this one nicknamed the Killer Résumé, but it appeared to have done little damage and was reportedly contained.

The virus, patterned on last year's Melissa worm, went out on May 26. Like Melissa and last month's I Love You virus, the Killer Résumé worm spread through Microsoft Outlook as an e-mail message. Its subject line reads "Resume — Janet Simmons," and includes an attachment called "Resumel.doc" or "Explorer.doc". If a user opens the attachment, the worm attempts to e-mail itself to the user's entire address list. It then attempts to delete files on the hard drive once the attachment is closed.

Antivirus software vendors, including Symantec Corp., Trend Micro Inc., Computer Associates International Inc. and Network Associates Inc., warned that the worm was spreading through some corporate e-mail systems. Trend Micro in Cupertino, Calif., reported that it had infected as many as nine sites.

However, the Computer Emergency Response Team at Carnegie Mellon University in Pittsburgh said it hadn't received any infection reports.

Cupertino-based Symantec and Santa Clara, Calif.-based Network Associates gave the résumé worm a medium-risk assessment because it didn't spread rapidly. Trend Micro and CA in Islandia, N.Y., rated it as a high risk, though Trend Micro downgraded that to medium later in the week.

Ira Winkler, president of the Internet Security Advisors Group in Severna Park, Md., said that the security community should talk more about how to stop viruses and worms. For example, users can prevent infection by disallowing macros and updating the definitions built into a user company's antivirus software, he said. ▀



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Digital Signature Bill Inches Closer to Vote

ITAA supports proposal, but consumer group calls for more protection; report not yet released

BY PATRICK THIBODEAU

LONG-STALLED DIGITAL signature legislation may be moving closer to a vote in Congress. A conference committee report, intended to reconcile differences between the House and Senate versions of the bill, now has the backing of a majority of the conference committee's members, several sources familiar with the process said last week.

However, the report still hasn't been finalized and publicly released.

The Information Technology Associ-

ation of America (ITAA), an Arlington, Va.-based trade association, last week called on lawmakers to pass a digital signature bill and said the conference committee report contains the major elements it wants to see in the bill.

Debate Continues

The proposed compromise would put electronic signatures on a legal par with written ones, would preempt state digital signature laws to keep a patchwork of different rules from developing and is technically neutral because it doesn't favor any single form

of digital signature technology, said David Colton, a program manager at the ITAA.

The legislation has also received much attention from the financial services industry, which wants to be able to issue mortgages and loans online. But the use of electronic signatures to authenticate financial contracts

has raised consumer-protection issues.

Margot Saunders, the managing attorney at the Washington office of the National Consumer Law Center and a prominent critic of the digital signature legislation, said the conference committee's bill still doesn't offer the protection she would like.

"We're disappointed it's not better, but we're happy it's not worse," she said.

Any report issued by the conference committee must still get approval from the full House and Senate.

The report will also have to pass muster with the Clinton administration, which has been critical of the legislation in the past. ▀

EU Overwhelmingly Approves U.S. Data-Privacy Regulations

Should make conducting business in Europe easier

BY ELIZABETH DE BONY

The U.S. last week became the first country outside of the European Union (EU) to receive recognition that its rules for protecting data privacy meet the requirements of EU member states.

U.S. government officials said this step should help ensure that American companies don't have problems conducting business in Europe.

Jonathan Todd, a European Commission spokesman, said at a daily EU news briefing that the Western European organization's 15 members had "overwhelmingly approved" the provisions of a safe-harbor agreement acknowledging the adequacy of U.S. data-protection rules.

The vote, which was taken during a meeting of the EU's Article 31 Committee on data privacy, follows an earlier recommendation by the European Commission that the agreement be approved.

The agreement was negotiated by U.S. and European officials in response to a 1998 commission directive that prohibits the transfer of personal data to non-EU countries that don't provide adequate privacy safeguards.

E-Commerce Aid

The agreement clears the way for U.S.-based companies that adhere to the safe-harbor principles to continue receiving information from databases maintained in Europe.

The European Parliament still has to review the agreement before it is formally adopted, but only the Article 31

Committee could have overturned an earlier favorable recommendation that was issued by the European Commission. The entire approval process should be completed by early next month, Todd said.

Although there were some concerns about the outcome of the Article 31 Committee's vote, EU and U.S. officials downplayed the risks that opposition from certain members — notably Italy, Austria and Spain — would block approval.

Decision Applauded

In a statement, U.S. Secretary of Commerce William M. Daley hailed the EU committee's vote as "a landmark accord for e-commerce" transactions between the U.S. and Europe. Without the safe-harbor agreement, U.S.-based companies also "would find it difficult to run multinational operations," because basic information about European employees couldn't be transferred here, Daley added.

The safe-harbor rules cover all industry sectors and virtually all forms of personal data, according to Daley's statement. Compliance by U.S. companies is voluntary.

The White House also released a statement about the vote, saying it will prevent the potential disruption of about \$120 billion in trade between the U.S. and Europe. Similar classifications for non-EU members Switzerland and Hungary are expected to follow before year's end, according to the European Commission. But recognition of Japanese and Australian data-privacy regulations may take longer to approve. ▀

De Bony writes for the IDG News Service in Brussels.

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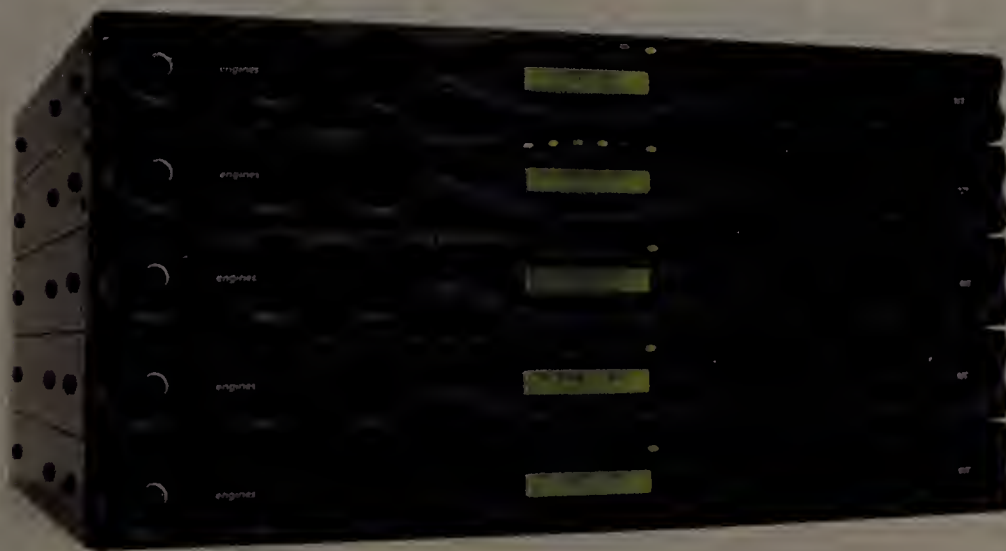
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BRIEFS

DecisionOne Offers Help for Broadband

DecisionOne Corp. announced last week its Broadband Deployment Services to help large companies install and maintain Digital Subscriber Line, cable modem and other high-speed connections. The Fraser, Pa.-based company said its new services cover customers' on-premise equipment, central office and cable head-end installation, line provisioning, fulfillment, technical support and other operations.

Extensivity Goes Mobile

Road warriors with Wireless Application Protocol-ready cell phones will be able to tap into Extensivity Inc.'s travel, billing, procurement and expense software. The Emeryville, Calif.-based company's Extensivity Mobile Connect includes security capabilities that authenticate users and give them menu access to available applications.

Sun Claim Against Microsoft Dismissed

After having already rejected Sun Microsystems Inc.'s copyright claims for summary judgment as well as portions of its licensing restrictions, District Court Judge Ronald Whyte has tentatively granted Microsoft Corp.'s request to dismiss Sun's claim for \$35 million in damages related to its Java programming language. Sun claimed that portions of its Java source code were posted on Microsoft's Web site, but Whyte ruled that Sun didn't prove Microsoft officers acted "willfully and intentionally."

Regional Bell Adds Online Upgrades

Cincinnati Bell Telephone has deployed a software upgrade system that will eliminate many of the on-site visits typically required when customers upgrade their telephone equipment. Cincinnati Bell, now a subsidiary of Broadwing Inc. in Cincinnati, said the software can be downloaded to equipment using all seven layers of the Open Systems Interconnection protocol over the company's Synchronous Optical Network.

Analysts: Stormy Days Ahead for Tech IPOs

Market cooling off after hot first quarter

BY MARIA TROMBLY
AND TODD WEISS

WITH INITIAL public offering (IPO) values dropping like hailstones in a summer thunderstorm, it was no surprise last week when handheld device maker Handspring Inc. lowered its IPO share pricing for the second time in two months.

Other companies are retreating from the public market. Two dozen companies pulled their IPOs last month — more than in January, February and March combined, according to New York-based research firm IPO.com Inc.

But there's no reason to think that the IPO decline — and the sharp drop-off in the money IPOs raise — will cause significant problems for U.S. technology development.

For example, the story behind Mountain View, Calif.-based Handspring's action was not necessarily bad. Jill House,

a senior analyst at International Data Corp. in Framingham, Mass., said that rather than reacting to a poor IPO reception, the company appears to be offering its stock at more modest prices to bring in investors.

Equally important for U.S. technology users, venture capitalists will continue to invest in

"Venture capitalists are long-term investors," she said. "But there is a sense right now to maybe hold on to an investment a little longer [to] make sure it's mature enough and developed enough to handle a turbulent IPO market environment."

Computer and communications companies remain the most attractive to venture capitalists, according to an NVCA report, with computer companies receiving \$12.4 billion and

Total Venture Capital Invested

QUARTER	NUMBER OF COMPANIES	TOTAL DOLLARS INVESTED (MILLIONS)
Q1 2000	1,557	\$22,684
Q4 1999	1,546	\$21,021
Q3 1999	1,264	\$13,004
Q2 1999	1,118	\$10,554
Q1 1999	851	\$6,161

SOURCE: NATIONAL VENTURE CAPITAL ASSOCIATION

new companies, even without the hope of an immediate IPO jackpot, said Jeanne Lazarus, a spokeswoman for the National Venture Capital Association (NVCA) in Arlington, Va.

communications companies receiving \$6.02 billion this quarter from venture capitalists.

Mark Opel, chief operating officer at Capital.com Inc. in New York, said he doesn't ex-

pect the technology venture-capital pipeline to be affected by market volatility.

"All deals are now subjected to more scrutiny than they were a few months ago," he said. "But the good deals and the good ideas that come out of the scrutiny continue to get funded. There are lots of folks talking about directing resources to infrastructure, and that's a trend that's likely to continue."

Venture capitalists have traditionally been more interested in infrastructure than in retail, said Jesse Reyes, vice president of Newark, N.J.-based venture capital research firm Venture Economics. Last year's mania for e-commerce firms was an aberration, he said.

"Now it's moving back upstream to more of the technology facilitation and infrastructure rather than the content at the other end of the pipeline. It's a move toward something they're a lot more comfortable with," Reyes said.

Meanwhile, venture capitalists continue to make profits from key investments. For example, Handspring's amended filing with the Securities and Exchange Commission said it will raise \$190 million before expenses by selling 10 million shares — a mere 8% stake in the company — giving significant returns to venture capital investors. ▀

Lucent Buy Marks All-Optical Network Move

Carriers now vying for market positions

BY JENNIFER DISABATINO

Murray Hill, N.J.-based Lucent Technologies Inc. agreed last week to purchase Chromatis Networks Inc. in a stock deal worth an estimated \$4.5 billion.

The purchase is part of Lucent's efforts to stay competitive in the burgeoning all-optical carrier market, said analyst Jim Slaby at Giga Information Group Inc. in Cambridge, Mass.

Herndon, Va.-based Chromatis has yet to release a product but has developed a fiber-optic system called Metropolis that can transfer voice, video and data on a metropolitan network.

According to Slaby, the gen-

erosity of the deal is an indication that the technology is top-notch. "They're looking at the best technology here, not necessarily who's got the best market share," he said.

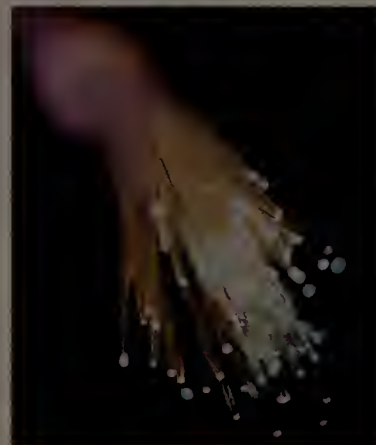
Chromatis' Metropolis represents a missing link in Lucent's optical network, Slaby said. Metropolis speeds up the transfer of data packets, voice and video by sending them through the bandwidth simultaneously at different wavelengths.

The technology, known as dense wave division multiplexing (DWDM), helps companies save money by avoiding the need to install more fiber-optic equipment, by streamlining the information that can be sent through the existing network.

That capability is the impetus of the deal. Metropolis will

allow Lucent to connect its core fiber-optic networks to its internal networks, said Lucent spokesman Ray Zardetto.

"This is a huge, kind-of-uncharted territory. The projec-



CHROMATIS NETWORKS has developed a fiber-optic system that can transfer data, voice and video on a metropolitan network

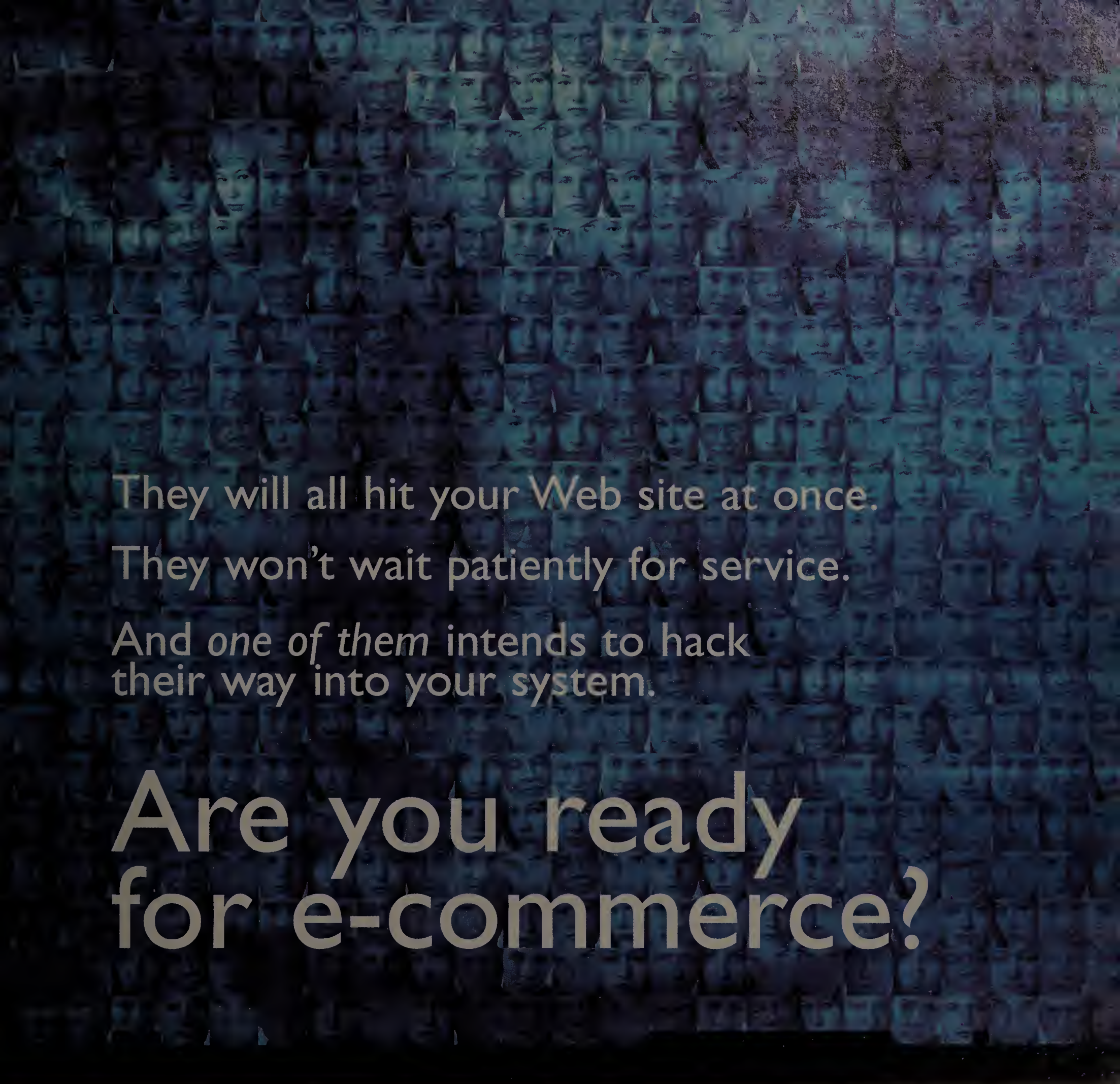
tions for this market are all enormous," Slaby said. "This is a huge, big-stakes game."

PaineWebber Inc. in New York estimates that the market for DWDM systems will grow from nearly zero last year to just over \$2 billion in sales in 2003.

And the major players in the market, including Lucent, Nortel Networks Corp. and Cisco Systems Inc., are investing a lot of money in all-optical networks.

Close to one-third of those firms' acquisitions and money spent during the past year was for all-optical network technology, Slaby said. "Everyone is hurrying to fill out their product lines," he noted.

So far, Lucent has invested the most for a DWDM company. Nortel paid \$300 million for Cambrian Systems Corp. in Kanata, Ontario, and Cisco spent \$800 million for Qeyton Systems AB in Stockholm. ▀

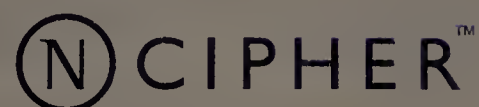


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MARYFRAN JOHNSON

Seize the data

IF THE WRITING ON THE WALL in Washington gets much bigger, Uncle Sam will need to start renting billboards on Pennsylvania Avenue to display it all. The government is clearly unimpressed with the high-tech industry's self-serving arguments that it can self-regulate to protect online consumer privacy. No

surprise that politicians are buzzing around this issue like wasps on cotton candy.

The FTC recently weighed in ["Privacy Concerns Rankle Industry," Page One, May 29] with a harsh assessment of the toothless privacy policies posted on so many popular Web sites today. Paired with that story was one describing a wireless technology that essentially spies on which stations car radios are tuned to and feeds that data back to advertisers. Yet another story ["Database Key in Airline Merger"] noted how a compelling reason behind the proposed merger of United and US Airways is the consolidation of two of the largest customer databases in the travel industry.

Politics aside, it's all about the customer data. Every company with a substantive online presence is collecting terabytes worth of "clickstream" data, and most of them, frankly, don't have a clue what to do with it yet. The latest technological Holy Grail is integrating this new source of online data with back-office business systems and front-office cus-



MARYFRAN JOHNSON is editor in chief of *Computerworld*. You can contact her at maryfran.johnson@computerworld.com.

tomers prospecting software. The smarter your data — the better you connect those e-customer dots — the more profitable the picture becomes. That's why business intelligence software — everything from Web site data analysis to CRM systems — is booming.

What's missing from this emerging scenario is the voice of IT leadership. In the good old glass-house days, technology departments were the chief data collectors. Then the PC revolution derailed that duty and handed it off to end users. In this new online century, the pendulum is swinging back with a vengeance.

It's time for IT to seize the data back again. Not just its care and feeding, but the strategic thinking around what your companies actually do with it. Make everything that supports and surrounds customer data *your* business. Make it the most critical focus of IT. Make sure the CEO understands the consequences of who sees what data and why.

Don't wait to read all about it on Uncle Sam's billboard. ▀

DICK HUDSON

Will GE hand CEO reins to a 'tech-age' leader?

IS IT POSSIBLE THAT A TECHIE could be the heir apparent to the legendary Jack Welch as CEO of General Electric?

The cover of a recent issue of *Fortune* magazine has Scott McNealy, CEO of Sun Microsystems, hugging Welch. It's accompanied inside by an article detailing their "best bud" relationship. When asked by *Fortune* if McNealy would be his successor, Welch declined to comment. At GE's recent annual shareholders' meeting, Welch assured the media that his successor (Welch plans to retire by the end of the year) would be an insider. McNealy sits on GE's board of directors.

At first blush, a Technology Age pioneer would be a least-likely candidate to run one of the world's largest Industrial Age icons. But given Welch's total commitment to the Internet and his creation of a technology-mentoring program for GE executives conducted by tech-savvy twenty- and thirtysomethings, it makes perfect sense. Welch's final legacy could be his most enduring: positioning GE to be a global leader in business-to-business e-commerce. GE isn't one of the world's most admired and talented companies without reason, and if McNealy becomes the next CEO, it will be a real coup.

By the end of this decade, most top-level senior executives must be more than just acquainted with computer technology, and GE's mentoring program is giving unusually early exposure to senior management for the company's next generation of executives.

These e-commerce and tech-savvy 20- and 30-year-olds will embrace the brave new world wholeheartedly, and GE must do so, too, or the company's famed talent pool will dry up. The next CEO must be a believer and disciple of the Technology Age. McNealy is such a CEO and would bring world-class smarts and Technical Age credibility for this venerable Industrial Age giant.

The effect of this appointment would be to shake up the orderly universe of the traditional brick-and-mortar outfits. Such a departure from mainline thinking would signal a significant psychological shift in succession planning and bring outcries of derision from those of the old school. Should they follow suit? Or sit on the sidelines and



DICK HUDSON is CIO at Global Marine Inc., a Houston-based offshore drilling company. Contact him at Dick.Hudson@glm.com.



watch? They will have to address the future of their mainstream businesses in a new and unsettling light. The decision by one of the world's most respected and admired companies and its CEO can't be ignored or dismissed. I believe a large number of financial services, transportation and retailing companies will embrace the senior IT manager as a serious candidate for the CEO job.

Regardless, if McNealy succeeds Welch, it will be the management story of the past 10 years. ▀

DAN DRAKE

We may be partly to blame for the Microsoft mess

I WONDER IF WE, as enterprise software buyers, aren't unwittingly responsible for the stifling of innovation for which Microsoft stands accused. We may think we're saving money, simplifying vendor relations and promoting integration, but we may be stifling innovation in the PC software market.

Two things make it difficult to compete in the PC software market today: software bundling, and operating-system vendors that give their application developers the documentation on application programming interfaces (API) before they give them to competitors' developers.



DAN DRAKE, a self-appointed innovation advocate, lives in the Salt Lake City area. Contact him at dldons@integrityonline3.com.

We buy software in bundles such as suites because it's cheaper than buying products individually, it reduces the number of vendors we have to deal with, and we may feel that we get better integration.

But I take exception with the assumption that you have to buy all your software from the same vendor to get products that work well together. Look under the hood of a car and you'll probably find an assortment of components from different manufacturers working in harmony. Software products from different manufacturers can do the same.

But by buying our software in bundles, we create two problems for innovators. First, we thwart the basic free-enterprise principle of "survival of the fittest." Second, we make it almost impossible for vendors that don't have a full suite of products to compete with those that do.

There are several reasons that the "fittest" software product may not prevail in a free-enterprise system: poor management, poor marketing and poor advertising are a few. But when we select a bundle of products to save money, rather than evaluate individual products and select the best in each category, we may also keep the "fittest"

products from prevailing. We send a message to the vendor that we're more concerned about a product's price than its quality or functionality. We also circumvent a process intended to weed out inferior products.

When we buy in bundles, we also impose a burden on vendors that don't offer a full suite of products. We force these vendors to choose: Should they use their limited resources to develop or acquire products that would make a competitive bundle? Should they try to compete on the merits of their individual products? Or should they not even try to bring an innovative product to market because they know they can't compete?

We can also stifle innovation if we buy products from an operating system vendor that gives its API documentation to its application developers before competitors' developers, instead of waiting for these competitors to exploit the new APIs. Better yet, we could pressure the operating system vendor to provide API documentation to competitors simultaneously. This would give them a fair chance to compete and innovate.

Since start-ups can't compete fairly in the PC

software market, they and their investors have migrated to other markets. (For example, Inprise/Borland, whose Quattro Pro and Paradox competed with Excel and Access, now concentrates on Internet infrastructure software on Linux, Solaris and Windows 2000.) How can we make sure we don't make the same mistakes and stifle innovation in those markets? And is there anything we can do to revive innovation in the PC software market?

I have four suggestions:

■ Begin by getting management's commitment to buy the most cost-effective products in each category.

■ Form pilot groups to test and measure which products in each category are most productive and cost-effective.

■ Let software vendors know how you plan to choose products.

■ Let platform vendors know you won't buy from them if they don't provide timely API documentation to competitors.

All this should encourage survival of the fittest and innovation. ▀

READERS' LETTERS

Easy target, indeed?

I NOMINATE Jaikumar Vijayan to receive the Understatement award for the headline on his May 15 front-page article, "Windows Easy Hacker Target."

Lewis Balentine
Network administrator
Perry Tritech Inc.
Jupiter, Fla.

GIMME A BREAK! "The renowned user-friendliness — and popularity — of Windows software" to which you alluded strikes me as blatant pandering. I don't find Windows or its software particularly user-friendly; either Windows crashes or I have to reboot at least three times a day.

As for popularity: There's no alternative to Castro in Cuba, but that doesn't make him popular. Windows is a user-hostile, technically inferior graphical-interface virus. Now that it's an "easy hacker target," it has become a remote-access virus as well. No wonder your calls to Microsoft weren't returned.

Doug Hamilton
Milwaukee

Keep away from my cookies, or else

DOES THE eBay court win mean the cookies in my computer are personal property and I can demand that Web sites not go there, let alone retrieve information from them about me without my prior approval ["Federal Judge Blocks Web Bot From Tapping Into eBay," *Computerworld Online*, May 26]?

This is a very cool legal platform from which to deflect stealth access to my computer by Web sites I may visit. My only question is, Who is going to help me enforce this no-trespassing right?

Bill Garber
President
Interlink Inc.
Berrien Springs, Mich.

Enough propaganda

YOUR REPORTING of biased feminist propaganda seems to be getting worse, based on your May 15 issue. Kathleen Melymuka's article "From Straw to Gold — and Back to Straw" [Ms. MIS] is very sexist.

While the entire tone is griping with no substance, the blatant discrimination is inexcusable.

Claiming stereotypical attributes for women (women are holistic, nurturing, known for valuing relationships, etc.) is precisely the kind of sexism Ms. Melymuka is presumably against. If you are going to do that, then you should also be talking about men's ambition, objectivity, technical prowess, "no excuse, sire" dedication to success, etc. in comparison.

The article "Glass Ceiling for Women in IT Persists" [News] is deliberately trying to create a biased picture by quoting selected individual statistics in inflammatory, sensationalist ways. The article says nothing at all meaningful or spiritually truthful.

Preston McHenry
Blue Bell, Pa.

Cyberstores would benefit from feedback

AS A FORMER "secret shopper," I enjoyed your article on e-commerce site feedback from the cus-

tomers' point of view ["Constructive Web Critics," *Business*, May 22].

Apparently, Web site designers are just as likely to be clueless about customers' opinions as their brick-and-mortar counterparts.

The big difference I see is that in a store, you can bend the ear of whoever is in charge. This is not always so easy at a cyberstore.

Many sites didn't offer an online feedback feature — or even an e-mail address for comments. This simple step might give them valuable feedback without the need for insights from paid survey companies.

Ed Griffin
Atlanta
emeegriffin@worldnet.att.net
More Letters, page 38

COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4843. Internet: letters@computerworld.com. Include an address and phone number for immediate verification.

What is Windows 2000 Advantage?

Windows 2000 Advantage is the partnership among Microsoft, Compaq and Computerworld Enterprise Business Solutions to inform IT leaders about Windows NT and Windows 2000 technology by providing timely, useful information — in print and online — for planning and deploying Windows NT and Windows 2000 with Compaq services and solutions.

Online This Week

Debunking Windows 2000 Myths

During his keynote presentation at the recent Windows 2000 Deployment Conference Microsoft's Dave Thompson, vice president, Windows server product group, told his audience that Microsoft spared no expense or time in creating Windows 2000. In order to underline that point, he debunked what he called "10 myths" about the new operating system.

Understanding the Active Directory Physical Structure

Active Directory relies on a physical structure. This structure involves the mechanisms for communication of Active Directory data and replication. In this article, we explore the structural component that governs reliable communication. Next, we examine the physical structure that stores and replicates Active Directory data known as the domain controller and its relationship to sites.

Richard Fade talks about the Compaq-Microsoft relationship

As vice president of OEM Multinational accounts at Microsoft, Richard Fade is responsible for Microsoft's business relationships with Compaq and a small group of companies that comprise the world's largest PC manufacturers. Just to put that in perspective, about 60% of the world's PCs are made by this group. Fade discusses the Microsoft-Compaq relationship and the value it offers to their customers.

Quickpoll

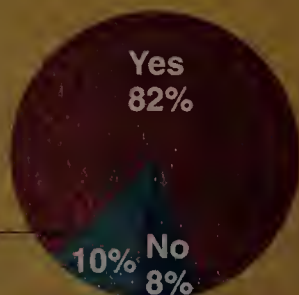
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Windows 2000

Kerberos explained

By Mark Walla

Although this article is billed as a primer to Kerberos authentication, it is a highly technical review. Kerberos is an integral part of Windows 2000 Active Directory implementations, and anyone planning to deploy and maintain a Windows 2000 enterprise must have a working knowledge of the principles and administrative issues involved in this front-line security technology.

Since many other operating system vendors are also adopting this MIT-developed authentication protocol, Kerberos Version 5 will increasingly become a centerpiece of enterprise-level interoperability. Kerberos provides

secure user authentication with an industry standard that permits interoperability. The Active Directory domain controller maintains user account and log-in information to support the Kerberos service.

The process of authenticating the identity of users during log-in is the first step in gaining system access. For local machines that aren't actively participating in a domain, Windows NT LAN Manager protocol is still utilized to verify a user's name and password before granting system access. However, in domain environments, Microsoft has coupled Active Directory closely with Kerberos. Once access is granted, tickets that permit specific access to other system resources within the domain are exchanged.

Kerberos 101

Underlying Windows 2000 security is the concept of user authentication. The centralized account management supported by Active Directory Services requires a corresponding authentication protocol for network log-on. Based on RFC 1510, the Kerberos Version 5 protocol provides enhanced authentication for the distributed computing environment and standardization to interoperate with other operating systems. ▶

For the full text of story, visit www.Windows2000-Advantage.com.



ADVANTAGE

► Feature

Compaq Intelligent Manageability tools make life easy for PC users

By Elisabeth Putnam

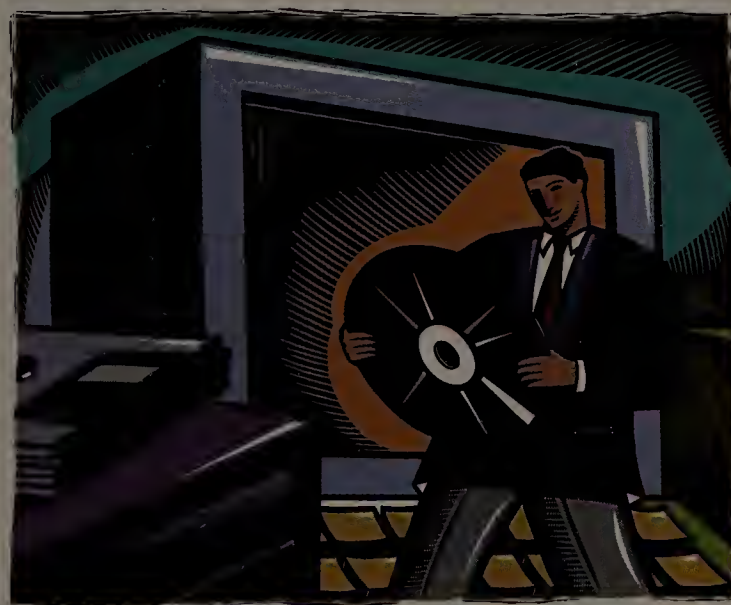
All over the world, technical support people are faced with the onerous task of installing, configuring and updating PC desktop software. Often, they must do it for hundreds or thousands of users at a time. This happens when a company acquires a new division, adds multiple overseas sites or decides to migrate to a more powerful hardware platform.

Done manually, the process takes between two and three hours per desktop. So it's no wonder that information technology support personnel would love to outsource the job — or at least automate larger pieces of it.

Now they can, thanks to some crucial additions Compaq Computer Corp. has made to its Intelligent Manageability product family.

About a year ago, Compaq introduced Insight Manager Light Console (LC), a Web-based, lightweight version of Insight Manager XE. Like its big brother, LC tracks assets and collects pre-fail hardware alerts such as read/write slowdowns or bad memory sectors. However, LC was designed to manage up to 200 desktops.

Insight Manager LC also automatically updates a PC's hardware configuration to match a predefined set of driv-



er and BIOS specifications, says Ed Reynolds, director of PC Lifecycle Solutions at Compaq. The platform can manage any brand of PC hardware that supports the Desktop Management Interface. It can also perform automated updates of basic software drivers.

One of the early implementers of Insight Manager LC was First American Credco, a Santa Ana, Calif.-based company that sells specialty credit reporting and information management products to mortgage lenders in a variety of industries. The company now has LC clients installed on all 1,400 of its desktops.

"LC allows us to proactively manage the desktop, notifying us if a case is open, if there's a memory change, if there's an abnormality like a

hard-drive error," says Mike Ratermann, network support manager at the firm.

Insight Manager LC also collects Compaq hardware asset information, which is then used to populate First American Credco's Microsoft Corp. Systems Management Server (SMS) database, Ratermann says. "It collects things SMS doesn't, providing detail I couldn't have without buying a separate third-party package — memory chip serial numbers, for instance."

Insight Manager LC proved to be a pivotal product for Compaq's Intelligent Manageability strategy, Reynolds says. ►

For the full text, visit www.Windows2000-Advantage.com.

The Web Magazine for IT Leaders

Implementing Windows NT and Windows 2000 with Compaq Services and Solutions

Point of View

Windows 2000 Datacenter gets optimal boost with ProLiant servers

By Steve James

Working closely with Microsoft, Compaq has optimized its ProLiant servers for use with Microsoft's Windows 2000 Datacenter Server, which is slated to be introduced this summer. This Compaq-Microsoft collaboration is targeted at business users and large dot-com firms deploying high-end, mission-critical applications demanding more processors and larger amounts of RAM.

Compaq's ProLiant push for Windows 2000 Datacenter Server is aimed at addressing customer concerns about the support, scalability and stability of Windows NT 4.0, says Robin Hensley, director of Compaq's Windows 2000 Datacenter Program.

In addition to optimizing ProLiant servers for use with Windows 2000 Datacenter Server, Compaq will support Windows 2000 Datacenter Server with its strongly focused Customer Services and Professional Services personnel, who are prepared to architect, deploy, support and manage Windows 2000 PCs running under all versions of Windows 2000.

To improve availabili-

ty, Windows 2000 Datacenter Server will offer four-node fail-over, which enables customers to configure larger clusters of machines. In four-node fail-over mode, three servers can each switch their operations to a fourth if necessary. This contrasts with the previous high-end version, Windows 2000 Advanced Server, which supported two-node fail-over clustering in which one server backs up another.

To improve scalability, Windows Datacenter Server will support more processors and larger amounts of RAM memory. Specifically, it will support from eight to 32 processors, compared with four to eight processors on Advanced Server. In addition, Windows 2000 Datacenter Server will support 64G bytes of RAM memory, compared with 8G bytes on Windows 2000 Advanced Server. Hensley says the support for more RAM will end the memory bottlenecks sometimes encountered in the use of very large databases.

For the full text, visit www.Windows2000-Advantage.com.

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GO

JOHN GANTZ

E-business skills shortage will eclipse IT gap

WE ALL KNOW ABOUT the current shortage of IT professionals. IDC's Michael Boyd calculates that this year, there will be a demand for 4.5 million IT professionals in the U.S. vs. a supply of 4.1 million.

Scary. But not as scary as an even bigger shortage on the horizon: e-business professionals.

These are the people running the online companies and divisions that are going to drive trillions of dollars of e-commerce over the next five years. They are online marketing executives, business planners and strategists, content creators, product line managers and so on. Some are even IT professionals.



JOHN GANTZ is a senior vice president at International Data Corp. in Framingham, Mass. Contact him at jgantz@idc.com.

As part of a recent e-commerce forecast, I had to estimate the number of individuals involved in making those trillions happen. Some are IT professionals, covered in the Boyd numbers, and some are non-IT professionals employed by vendors. But most are professionals working in the e-businesses themselves. A small percentage of them work in dot-com companies, but a lot more work in brick-and-mortar companies.

The numbers don't look too bad today. I estimate that there was demand for less than 5 million e-business professionals last year, and most of that demand was filled. It may have been filled with kids under 30 years old or by executives drafted from off-line business units, but it was filled.

But if e-commerce meets that multitrillion-dollar prediction, the demand for e-business professionals will grow to 20 million positions, making it bigger than the worldwide community of IT professionals.

Where will these people come from?

The two best sources will be enlightened individuals in off-line business units and IT professionals with the right personalities and attitudes.

What does this mean for you?

If you're an IT professional with "crossover" aspirations, some business background or acumen and the right personality, you'll have much better job opportunities. You can leave the IT profession behind and become an e-business executive (and your IT background will help).

But if you remain in IT, you will increasingly work hand-in-glove with e-business colleagues, many of whom will either be inexperienced in

business but big in the online stuff, or experienced in business but clueless in technology.

We already see this dichotomy in the world of Internet start-ups — the laboratory for tomorrow's Internet economy. There aren't enough people with both business and online experience, so we see companies hastily formed around business plans and populated by young people with little real-world experience and whatever wizened veterans the venture capitalists can find to give their investments a fighting chance.

Since a lot of tomorrow's e-business execs are likely to be draftees, the opportunity for IT professionals to have real impact on company strategy, product plans and sales will rise dramatically. When the business is e-business, the technologists have to be in on the ground floor and at the inception of the business. For many, this will be a heady experience. But it isn't risk-free. You'll be helping to make decisions that affect the future of your company, not just implementing the decisions of others. I hope you're up to the task. ▀

BILL LABERIS

Congress: Stop giving the Internet special treatment

TAX THE INTERNET.

Or more appropriately, stop treating the Internet as though it was some special class of citizen deserving the tax-exempt treatment usually reserved for churches, universities and charities.

I say this as a staunch libertarian with a profound distaste for big government and a belief that we could run our public affairs with far fewer taxes than we now collect. But in exempting Internet commerce from additional taxation, as Congress has overwhelmingly done (and is considering extending through 2006), we single out the Internet as something other than what it is, namely, a commercial venue, just like a brick-and-mortar mall.

Further, we place a clearly unfair burden on those least likely to trade on the Web — lower-income groups — while easing the tax burden on those who do trade on the Web, generally middle- and upper-income groups.

But putting aside egalitarianism for a moment, let's look at the politics behind the current moratorium on additional federal, state or local taxes on Internet access or e-commerce.

Two years ago, Congress authorized an Advisory Commission on Electronic Commerce to rec-

ommend some direction regarding Internet taxation. Comprising various state government officials as well as executives from AOL, AT&T, Gateway and others, the committee immediately split into protax and no-tax camps. In March, the committee announced it lacked the two-thirds majority needed to make a formal recommendation to Congress.

The stated reason for the Internet's status is that Congress wants to protect e-commerce from being strangled in its infancy by taxes, primarily state sales taxes. Most states with sales taxes have legitimate concerns about potentially heavy revenue losses, particularly when e-commerce revenues are predicted to top \$1 trillion by 2003.

Predictions such as those from venerable sources like IDC and Forrester Research don't have disclaimers like "provided e-commerce isn't taxed." The unbridled growth of e-commerce is a slam-dunk. Just ask any IT manager whose life has been unbraided by executive mandates to "move the business to the Internet." There's no proof that reasonable sales taxes will stunt that growth in any way.

Meanwhile, the feds say it's perfectly OK to continue taxing goods sold by brick-and-mortar establishments. Utah's governor, Michael Levitt, a member of the advisory committee, argued unsuccessfully to Congress that traditional companies are being put in an untenable position when their online competitors can sell tax-free and they cannot.

Ask yourself this: Where are the low-income, the elderly and poor likely to shop today — at Wal-Mart or Walmart.com? And Congress wants which type of purchases to be tax-free for buyers?

I don't blame the big IT companies that are lobbying for a tax-free Internet. But what about Congress' motives?

I believe its members are driven by three things. First, they've always liked cozying up to campaign contributors with very deep pockets, and certainly, the computer world is filled with them.

Second, Congress likes to set industrial policy rather than let free markets do so. Motivated more by political expedience, this has yielded protectionist policies that favored big steel in the 1950s and '60s, and light-truck makers even today. Now Congress wants to "protect" the Internet, as though it needs it.

Third, is it possible Congress wants to reserve any future taxation for itself rather than the states, believing Washington is better at allocating public funds? The Constitution allows Congress to overrule the states in certain matters of taxation, not unlike an Internet or e-commerce tax. In preventing states from recouping the increased tax revenue generated by the growth of e-commerce, Congress forces the states to either defer to other taxes (like income taxes), do without the additional revenue (a good lesson for Congress) or come groveling to Washington for more money.

Yes, tax the Internet, just like we would any other commerce medium. Failing to do so is elitist, destructive of other non-Internet businesses and just plain unfair. ▀



BILL LABERIS is a consultant in Holliston, Mass., and former editor in chief of *Computerworld*. Contact him at bill@laberis.com.



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User group president and one MetaLink user defend Oracle's Web support system

AS THE executive vice president of International Oracle Users

Group Americas (IOUG-A) and a customer of Oracle Support Services (OSS), I would

like to comment on the May 15 article about Oracle's Web support system, Oracle Meta-

Link, which Christine McGeever wrote after attending a session with OSS management at the IOUG-A Live Conference ["Oracle Users Wary of Its Web-based Sup-

port Plan," News]. The article was good and pointed out some of the fears that people have in moving to online support. But I believe that those who use the online service to its fullest extent are extremely happy and use it as their primary resource. Other software companies would do well to follow Oracle's lead.

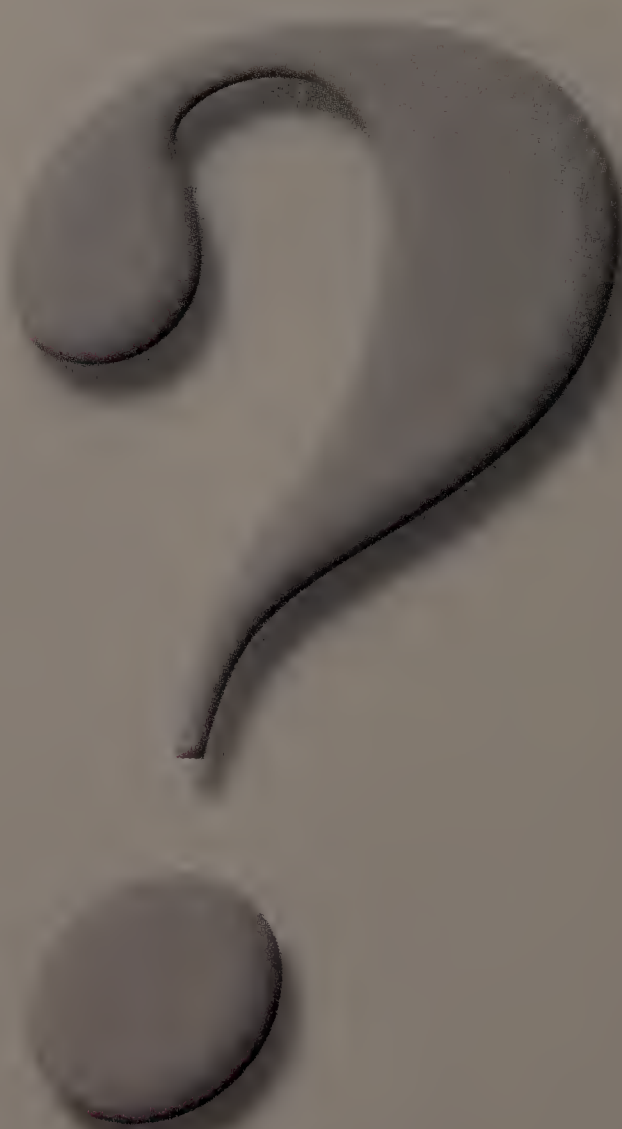
Oracle MetaLink with Internet Technical Assistance Request functionality is one of the best services I've seen in the world of customer support. Since its introduction three years ago, MetaLink has continually improved. Users expect online service for their technical support needs and have been requesting enhancements on MetaLink so they can use the Web more and more as they work with support.

MetaLink allows you to set up a personalized Web page so that you can keep track of technical assistance requests, bugs, new products and even your own support licenses and products at your company. Options like these are crucial improvements that use push technology to put the Oracle customer in control of what he sees and subsequently make his life easier.

From my conversations with OSS management, I expect Oracle customers will see even more improvements to OracleMetaLink.

Rich Niemiec
Chicago
CEO, TUSC
rich@tusc.com

HOW WILL YOUR IT STAFF SUPPORT
THE INCREASING AMOUNT OF ENTERPRISE
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AS AN Oracle database administrator with about seven years of experience, I have waited as long as two hours on the phone for Oracle technical support. In the last six months, I have been using MetaLink with very positive results. I've done everything from nontechnical requests for software upgrades to asking fairly complicated questions.

A very valuable feature of MetaLink is the ability to search the technical databases. I agree that phone support should be an important part of Oracle's technical support, but if a lot of questions and nonemergency problems can be answered through things like MetaLink, hopefully

more resources would be available at Oracle to quickly answer critical emergency calls.

Yaca Attwood
Chino Hills, Calif.

Linux user grateful for realistic perspective

THANK YOU, Mark Hall, for your realistic perspective on the Linux market ["Unrest in Linux Land," News Opinion, May 15].

I too believe that Linux will get through this market test with flying colors. I base this on my daily use of the operating system and the applications that run so well on it. The small business owners that we deal with are in love with the price and performance of Linux products.

More and more applications are being ported to Linux; potentially any Santa Cruz Operation product (with a clean code base) is a recompile away from a Linux version.

Alex Coker
Linux Enterprise Application
Products Inc.
Dallas
adcoker@leap4linux.com

Putting the blame on those who are no longer around

IT'S COMMON knowledge at GE that the blame for any problems with a project will fall on the people who leave before its completion.

Hence, it was no surprise to see that an earlier project team was blamed for the missteps in GE Aircraft Engines' e-commerce site ["The \$11 Billion Web Start-up," Business, May 1].

It was very disappointing that you reported it as fact.

Your article made it sound as if a few new employees made a difference in implementing the project.

The article neglected to mention that the same managers who hired the new team also participated in the first project; they knew of and approved that "unfocused" plan. Nor did it explain that most of the original project team (including me) left the company in frustration with a process that slowly grinds down any enthusiasm for work.

Further, nowhere did the article mention the six months of inactivity in which the project team was repeatedly forced to submit financial impact statements of a yet-to-be-

designed Web site. Or the months-long delay in trying to schedule a meeting with the "blackbelts" and senior management. Or the two months when no work could be done

while purchasing negotiated with the vendor.

What really changed during the two-plus years of the project was management's attitude. Only when Jack Welch

spoke of the need for e-commerce in the business in 1999 did management decide to concentrate on the project.

Jeffrey Marks
Cincinnati

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- **General Magic Inc.** subscribers access personalized data and services stored on the Internet and other networks by talking with a friendly, interactive computer personality.
- **Level 3 Communications Inc.** has introduced the world's first upgradable international fiber-optic network to be completely optimized for IP technology.
- Real-time personalization software from **NetPerceptions Inc.** learns the interests of consumers and matches them with products, making Internet shopping more efficient.
- An Internet navigation system from **RealNames Corp.** transports people directly to brands on the Web and can be used in any language or character set to improve a company's return on advertising investments by unifying its identity online and off-line.

Education & Academia

- Through **Computer Curriculum Corp.**'s CCC Destinations program, technology is focused on unlocking the learning potential of a half-million underprepared adults and adolescents in alternative education sites in North America and the U.K.
- **Echoes Digital Team's** rapid translation of archaeological data into 3D virtual reality lets Internet users appreciate and support the Yodefat excavation site, which is offering insights into lower Galilee in the years of the religious mission of Jesus.
- Web-based education from **HealthStream Inc.** provides medical professionals worldwide with continuing education from the nation's academic and medical thought leaders, spreading knowledge about new medical advances, improving compliance with medical regulations and enhancing resultant patient care.
- At **Montgomery County Public Schools**, the Early Childhood Technology Literacy Project promotes early childhood use of computers to teach reading and writing, helping to ensure that each child can read by the start of third grade.
- Through the **University of Texas at Austin/Charles A. Dana Center's** Support for Homeless Education: Linking Technology Resources to Shelters project, new technology resources and skilled tutors help provide educational enrichment to children of homeless families.

Environment, Energy & Agriculture

- Officers at the **Department of Primary Industry and Fisheries** in Australia's Northern Territory are equipped with GPS receivers to report the growth patterns of noxious weeds, providing the basis for weed-control strategies.
- **Duke Energy North America's** online intranet delivery of pricing, cost and power-supply data supports electric power marketers in making bids to supply power to a wholesale market, ensuring that consumers receive maximum value for their energy dollars (see story, page 42).
- Status data from nearly 10,000 points in gas and electricity distribution networks at **Illinois Power Co.** flows into a control center every few seconds, ensuring immediate and effective responses to unexpected situations.

Continued on page 42

ERIC MILLETTE

The Computerworld Smithsonian Awards recognize winners of their business's potential, gain a competitive edge.

Pushing

AMERICAONE

CAD System Puts Wind In Cup Challenger's Sails

BY LORRAINE COSGROVE WARE

THE RACE FOR THE America's Cup is extremely competitive. The world's most celebrated boating event, it dates from 1851. But the competition for the oldest trophy in international sport begins months, even years, before the boats hit the water. AmericaOne, the San Francisco-based challenger for the America's Cup, relied on computer-aided design (CAD), Internet collaboration tools and a passion for sailing and design to build two of the world's fastest sailboats.

An America's Cup challenge is very secretive, and design is critical. Competitors hold off on building their boats for as long as possible to first consider every possible design and innovation. "An extraordinary sailor in a slow boat will rarely beat an ordinary sailor in a fast boat," says Bob Billingham, chief operating officer of AmericaOne.

Unlike other development projects, however, the deadline never slips. The product has to be delivered in a finite amount of time and with one primary purpose: to win the most prestigious race in boating history. "It's an aerodynamic and hydrodynamic problem," says Robert Hook, sail designer for AmericaOne. "It's like building an airplane that is half underwater and half above."

Using San Rafael, Calif.-based Autodesk Inc.'s AutoCAD and Volo View Internet collaboration tools, AmericaOne's 40 naval architects, fluid dynamists, research scientists and structural analysts were able to share drawings and concepts in real time with the crew and builders who were scattered from California to New Zealand. "Technology changes the competitiveness of the race," says Gina Von Esmarch, marketing director for

AmericaOne. "The ability to collaborate from any location, using the Internet, means that you don't just get the best engineers and designers in the area — you get the best in the world."

Before CAD, the AmericaOne design team could examine only six designs per campaign. Team members had to be assembled in one location or receive information via mail or fax. The phone offered the only real-time collaboration among remote team members but left the door open for incomplete or misunderstood conversations.

Typically, boat design is a serial process, starting with a hull model, then the keel and finally the sail, with very little communication among the different design teams. Using modeling and collaboration tools, however, the AmericaOne team was able to integrate its design efforts and consider thousands of alternatives. Design changes such as an innovation to the sail, which affected the mast's position and the weighting of the keel, were implemented much more quickly and easily than with previous design processes.

The 2000 America's Cup, which was held off the coast of Auckland, New Zealand, in January and February, was a closely contested race. AmericaOne lost to the Italian Prada Challenge team's *Luna Rossa* by seconds. Team New Zealand ultimately won the Cup.

Looking back, the U.S. team reflects on what it accomplished in an astonishingly short time. The project was driven by passion — with many team members donating their time and expertise for the chance to regain a title and national pride. Technology and the Internet have changed competitive boating and the perception of yacht racing.

"With the help of the Internet, we caught America's attention," Von Esmarch says.

AMERICAONE'S GINA VON ESMARCH:
"Technology changes the competitive-
ness of the race"

wards 2000 finalists use technology to explore the limits
competitive edge and, in one case, keep democracy alive.

the Envelope

COMPUTERWORLD

Smithsonian Awards2000 Finalists

Continued from page 40

- In the U.K., the **Royal Society for the Protection of Birds'** Merlin Conservation System supports rapid analysis of the impact of development on birds, habitats and sites important for wildlife, helping to preserve the natural heritage for future generations.
- Dynamic generation of Web pages through the **Aero-biological Network of Galicia** gives citizens access to the latest environmental data, providing particular benefit to those affected by allergy-related diseases.

Finance, Insurance & Real Estate

- Through the **Canadian Payments Association's** Large Value Transfer System, participating financial institutions can send secure payments in Canadian dollars across the country virtually instantaneously, with confidence that the funds are good (see story, page 46).
- Medical referrals are shared over the Internet in real time among doctors, specialists and medical suppliers using the **Health Alliance Plan's** Internet Healthcare Coordination, giving patients fast access to medical services and virtually eliminating the referral process.
- Real-time analysis software, **Nasdaq Stock Market Inc.'s** Surveillance Delivery Real-time System, inspects each of 6 million transactions per day and within two seconds alerts analysts of any that are unusual, protecting the market's integrity and maintaining a level playing field for investors.
- The **Nationwide Building Society's** iris-recognition program offers the first use of iris recognition in a specially equipped bank branch, allowing more than 98% of all transactions to be completed without a personal identification number.
- Smart-card technology from **Proton World International** offers consumers electronic purses, a secure, convenient and fast means of making payments in shops, at machines and over the Internet.

Government & Nonprofit Organizations

- The **Independent Electoral Commission of South Africa's** use of geographic information system technology that's accurate to within 2 meters determined voting districts and drove one of the world's most highly publicized elections to a fair and free result (see story, this page).
- The **Library of Congress' National Digital Library/American Memory Project** is a 60-terabyte (TB) database that supports Internet availability of millions of rare documents of U.S. history in an easy-to-use site.
- A multilanguage computer learning system, **Reactive Acquisition of Vocabulary Elements from Raytheon Training LLC**, can understand and speak in multiple languages to help students thrive in environments of non-native language dominance.
- The **U.S. Patent and Trademark Office's** Patent Full-Text and Image Database offers first-ever public Internet access to more than 2TB of full-resolution images of more than 2 million recent patents.
- Electronic postage from the **U.S. Postal Service** integrates with a variety of word processing, accounting and

Continued on page 43



"IN THE PAST, we really didn't have a feel for what power was available and if it was the cheapest power," says Duke Energy's Murray Nixon.

DUKE ENERGY NORTH AMERICA

Intranet Enables More Competitive Energy Bids for Wholesalers

BY MATT HAMBLIN

IN THE ELECTRIC-UTILITY WORLD, deregulation has forced business and technology managers to innovate and find ways to compete as they never have before, observers say.

In this environment, information technology managers such as Brad Black at Duke Energy North America in Charlotte, N.C., are like kids with new toys in a sandbox.

Duke built its own Real Time Performance Cost Monitoring System a year ago to provide quick information for bids on power to the wholesale energy market. Black and his team set up a Java-based thin-client system, keeping intelligence on servers and allowing access from a variety of devices located anywhere on the company's intranet. Devices used to monitor information from plants or offices could be PCs, laptops, smart phones — or even toys.

"We couldn't wait until we installed a Sega Dreamcast as one of the Web browsers, and it works great. We got probably the 10th one that Sega made, we wanted it so much," says Black, manager of technical projects. "It was easier to set up the Dreamcast than the Qualcomm PDQ phone."

Black specifically chose Sega of America Inc.'s Dreamcast browser to show that any device, even a toy, could be used to access the pricing, cost and power-supply data from any of 10 plants nationwide and, soon, dozens of others. Allowing flexibility with

end-user devices will matter, as Duke partners with a variety of companies to produce and sell power.

Black and Murray Nixon, the project's business manager, say the \$200,000 monitoring system has already paid for itself. But Black says it's impossible to measure how much of a business advantage the tool will give \$17 billion Duke, as it adds plants nationally and globally during the coming years.

The system shows bidders, plant managers and corporate asset managers a snapshot of the production capability of all plants throughout each day. It separates out the production needed for existing clients, allowing bidders and others to see what capacity is left for bidding on the open market. Armed with this data, bidders can set a price for wholesale energy in markets controlled by energy aggregators, shipping power to an area where demand is high from an area where production capacity is available.

"In the past, we really didn't have a feel for what power was available and if it was the cheapest power," Nixon says.

Experts say the big utilities will use such systems to try to sell into high-demand markets. One such market was the Northeast U.S., which faced a hot spell in early May at the same time many power plants in that area were down for maintenance.

During that heat wave, power was selling in the Northeast for \$6,000 per megawatt hour, compared with only \$300 per megawatt hour in the Midwest on the same day, Black says. "Clearly, many utilities want to be ... at the high end for the profits," he says.

Black and Nixon believe their monitoring system has resulted in lower energy costs in homes and businesses, but they can't quantify by how much.

The Duke innovation shows that the traditionally conservative utility industry is moving more aggressively, prompted by competition, analysts say. "Their project shows that the interesting developments don't involve the electricity commodity but the information that one can glean from it," says Ethan Cohen, an analyst at Aberdeen Group Inc. in Boston.

SOUTH AFRICA

GIS Technology Builds Infrastructure to Aid Fair, Fast Elections

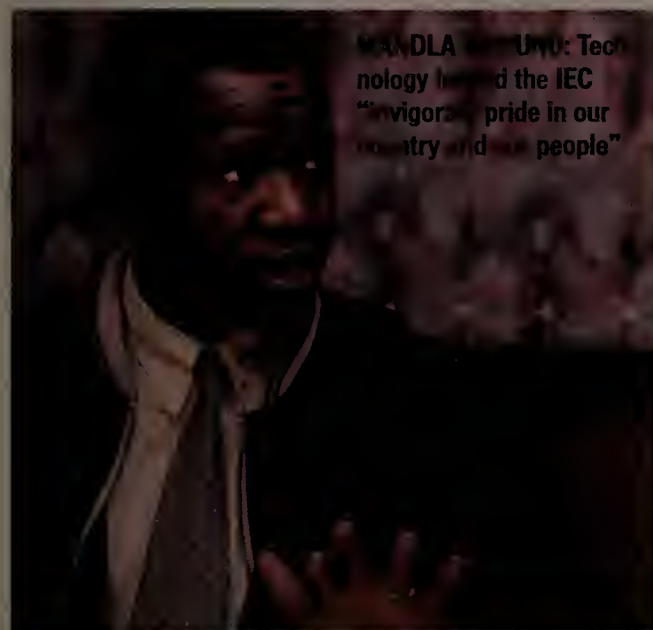
BY MARI KEEFE

THINK BACK TO THAT LAST big IT project you worked on. Remember the number of endless details and people to coordinate, the scope creep and, worse, how it seemed as if every officer in the company was watching? Just imagine the pressure if the whole world had been watching.

Well, last year, the whole world was watching Mandla Mchunu, chief electoral officer, and his information technology team at the Independent Electoral Commission of South Africa (IEC). And their project was daunting. In 1997, Mchunu was charged with ensuring that South Africa's second post-apartheid elections were democratic, fair and fast.

It "was clear from the onset," Mchunu says, "that we needed to use technology as an integral part of the election process."

He and his team also had less than one year to plan and implement the project and deliver the elections.



MANDLA: Uyo: Technology helped the IEC "invigorate pride in our country and our people"

It sounds like a recipe for failure. Worldwide experts said the data collection would take three to five years. South Africa's 1999 population of 43,426,386 was nearly three times that of Florida. Some citizens didn't have permanent addresses and were unable to read or write. There was no infrastructure in place to dependably gather and transmit electoral data. Plus, there was heightened publicity and intense political pressure.

But failure, says Mchunu, "was not an option." Any failure in the delivery of a sound election, he added, would affect the perceived health of South Africa's democracy, affect its economy and have implications for the country's status as a role model for the region. Besides, the international scrutiny of the elections wasn't focused on "who was elected" but on "how they were elected," Mchunu notes.

The technology the team chose to implement as the backbone of the electoral process was a geographic information system (GIS) because, Mchunu points out, "key to the success of the elections was the compilation of an accurate voters' roll." The team created a customized, continuous spatial database with electronic maps of the country, accurate to 2 meters in urban areas. This information, overlaid with 1994 census information, determined the 14,500 voting districts, based on many spatial and demographic parameters, where people would first be registered and then could vote. "At the peak of the process, we recorded 44 million transactions to our database in a 24-hour period," Mchunu says.

Next, a means of communication to the local electoral delivery mechanisms was needed. In less than six weeks, the team trained staff and implemented a satellite-based wide-area network communications infrastructure. Some of these areas had never had data communications services before.

In addition to connecting local election officers to the IEC, the communications infrastructure also served as a basis for the registration process. Mchunu says they were able to register 9.7 million people in the first weekend alone.

When it was time to vote, this communications system enabled the team to disseminate results in real time on large-scale GIS maps so the media and political parties could map the progress. The elections took 14 hours, with 16.2 million people voting.

The most gratifying moment "was the evening when the final results were announced," says Mchunu, reflecting on the IEC's success with the election. "Leading-edge technology provided our organization with the ability to invigorate pride in our country and our people."

DELTA AIR LINES

Digital Nervous System Speeds Airline Data to Customers, Employees

BY LINDA ROSENCRANCE

IMAGINE IF BUYING an airplane ticket were as easy as taking money from an automated teller machine.

Well, it can be — at least if you fly Delta.

As part of its new customer care system, Atlanta-based Delta Air Lines Inc. has installed new self-service ticketing kiosks at Delta Shuttle locations in Boston, Washington and New York and plans to roll out kiosks in additional cities this month.

But that's not all: The new system, designed by Delta Technology Inc., the airline's information technology subsidiary, also includes such features as an electronic gate reader that processes passenger boarding cards automatically using bar-code technology and new gate and boarding software that provides flight summaries and passenger information such as updated seating charts.

The kiosks allow passengers with electronic tickets to print out boarding cards with just a few taps on a screen. Customer information displays show real-time updates, including the status of inbound and outbound flights, the expected length of any delays, the type of meal on your flight and the weather conditions at your destination.

In addition, passengers can access information such as their itineraries, flight schedules and real-time arrival and departure information. They can also access same-day gate information via the Internet using wireless communication devices including pagers, cellular phones, personal digital assistants and handheld PCs.

The customer care system is part of the "digital nervous system," an integrated digital network that collects data, records events — such as mechanical problems with a plane or even bag check-in times — and automatically gets accurate, up-to-the-minute information for passengers and employees.

Keith Halbert, senior vice president and chief development officer at Delta Technology, says the idea for the customer care system grew out of the airline's



DELTA TECHNOLOGY'S Keith Halbert says the airline's customer care system offers passengers the service features they'd been asking for

COMPUTERWORLD

address management software packages to give users secure, convenient access to postage at their desktops.

Manufacturing

■ Use of computer-aided design software over the Internet allows more than 30 naval architects, fluid dynamists and structural analysts to combine their talents in the design of the yacht the **AmericaOne** team entered in the America's Cup race (see story, page 41).

■ Through a **Danfoss Drives** system, fulfillment of factory orders triggers the printing of manuals and documentation in the correct local language, with the finished manual set available in a half-hour.

■ **Juniper Networks Inc.** offers the fastest real-time applications ever to traverse a wide-area network, with 2G bit/sec. of aggregate throughput, setting the stage for the next-generation Internet2 and enabling the flow of rich multimedia among people worldwide.

■ The process of building a custom houseboat is energized by providing **Sumerset Custom Houseboats** customers with access to their own Web pages where the factory posts photos of their boats every day, saving customers thousands of dollars.

■ The strong integration of electronics in cars by **Volkswagen AG** promotes improvements in functionality, comfort, safety and value for drivers.

Media, Arts & Entertainment

■ An immersive interactive connection to ongoing sporting events over the Internet from **Quokka Sports Inc.** creates a montage of experiences for viewers.

■ The pioneering development of streaming media technology from **RealNetworks Inc.** is helping transform the Internet into the next mass medium by making real-time Internet broadcasting possible and profitable.

■ Through **Riverbed's** Biped project, integration of projected images of dancers, with live choreography, gives rise to a new artistic experience and provides a near-perfect digital record of dance performances.

■ Closed captioning and video descriptions from the **WGBH Educational Foundation** make TV, film and digital media more accessible to 37 million Americans with sensory disabilities.

■ A new form of arts center, **Zeum**, merges the performing, visual and media arts with the tools, images and content of contemporary culture.

Medicine

■ Through the **American Red Cross**' Displaced Persons Linking System, mobile computing, digital imaging and the Internet help re-establish communication among the victims of disasters.

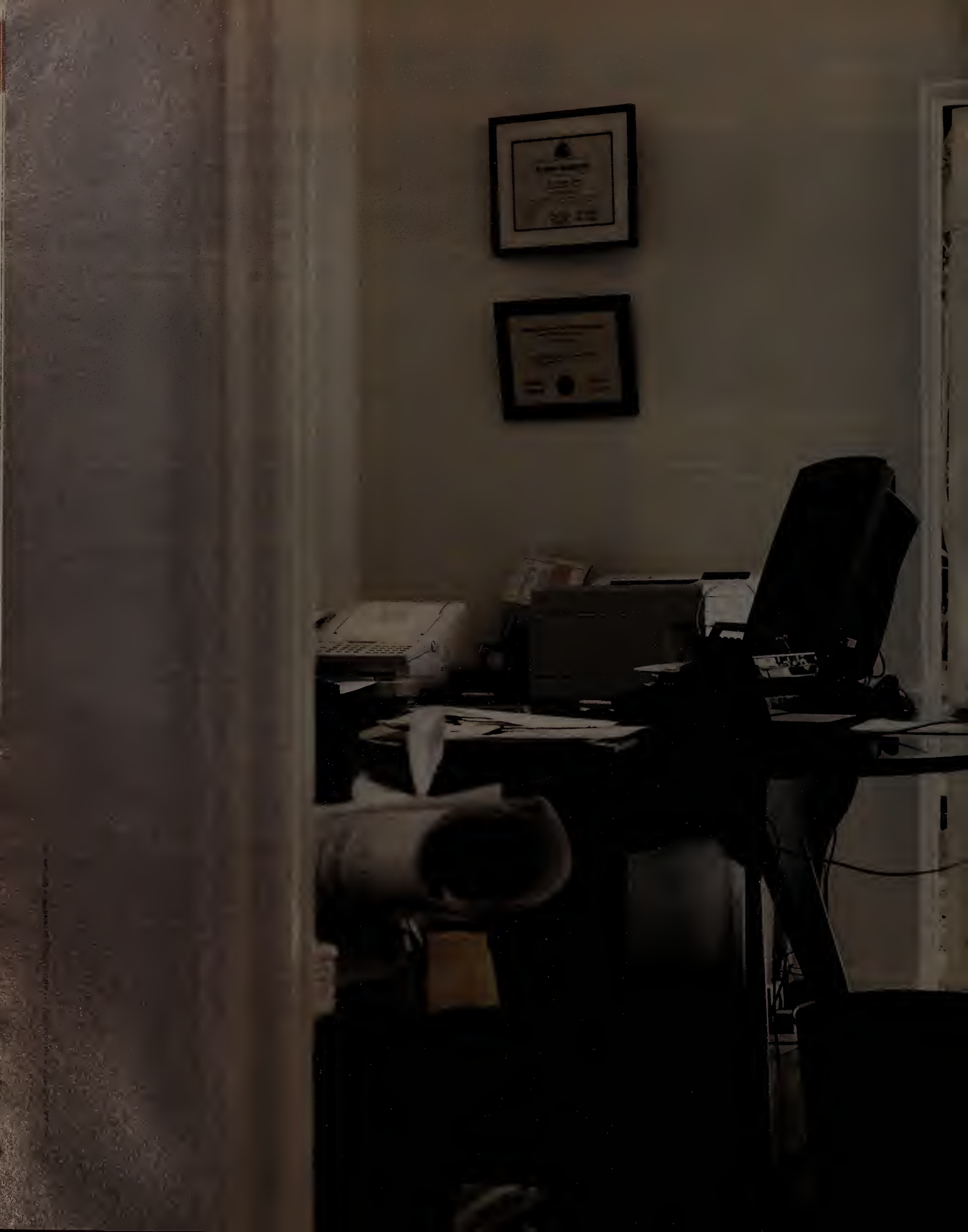
■ A consumer-focused interactive portal, **Drkoop.com Inc.**'s Global Health Portal, provides health care information for the public, individuals with health conditions and those who have recovered from injury or illness — all at a level the average consumer can understand.

■ Through the **NDC Health Information Services**' Care Reminder, patients receive personalized and confidential reminders via pager, voice mail, e-mail or fax to take their medicine or refill prescriptions, ensuring that the full benefits of medicines are realized.

■ Pervasive telemedicine technology from **Partners HealthCare System Inc.** integrates physician training between two large, geographically separated teaching hospitals; supports an urban network of more than 1,000 primary care physicians; and provides second opinions to patients in 30 countries.

■ International tracking and coordination of the use of marrow transplants from unrelated donors through the

Continued on page 46





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plans to enhance customers' airport experiences and to create new IT capabilities within Delta.

"Delta Technology laid the foundation for the digital nervous system," says Halbert. And that foundation "formed our ability to deliver our new customer care system."

Halbert says that in a way, the company built a set of sophisticated tools — an entire system — to "holistically" care for its customers. The idea, he says, was to make it easier for Delta's employees to provide customers with the best possible service.

"We [focused on] how to make time fly for customers," he says. "Now, passengers can check in at the curb and get their boarding pass, even if they're not checking in any bags. Or they can go to the self-serve kiosk and get an electronic ticket and proceed to the gate."

"And the customer information displays tell you how long your trip will take, what food is on the plane, what the configuration of the seats is, and will eventually show you a clip of the [onboard] movie," Halbert says. "These are all things customers have been asking us for."

Krista Pappas, an analyst at Gomez Advisors Inc. in Lincoln, Mass., says the customer care system shows that Delta has gone to great lengths to hold consumers' hands.

"Customer confidence is very important," Pappas says. "It's important to add different avenues by which customers can access different information. Delta is increasing its value to its customers, especially to the road warriors or business travelers, as well as to all the people on the road, by allowing them to access information through their handhelds."

CANADIAN PAYMENTS ASSOCIATION

Money Transfer Technology Brings Canada Up to Speed

BY MARIA TROMBLY

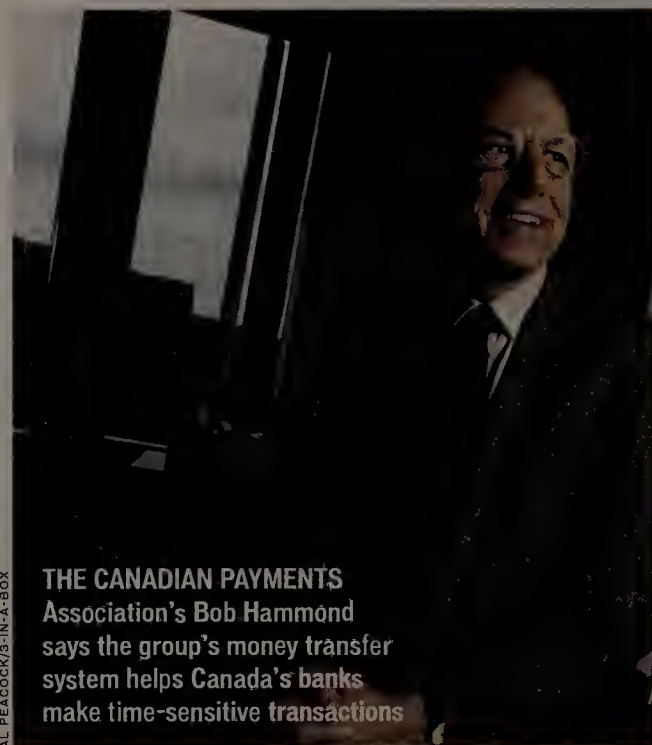
THE PROBLEM WITH MOVING money around in Canada six years ago was that it took a while to determine whether a check was good.

The fastest method, the Interbank International Payments System, took an entire day. During that day, anything could happen — the person who sent the money could withdraw all his funds or go bankrupt, or the bank itself could go under.

As a result, those on the receiving end had to either trust the sender and his bank or wait before doing anything with the money. In a worst-case scenario, a bad money transfer for a large amount could cause a domino effect across the banking system, as company after company and bank after bank drew on nonexistent funds to make payments, transfers and withdrawals.

To solve that problem, the Canadian Payments Association (CPA) in Ottawa and its member banks decided to create a system for guaranteeing money transfers. Called the Large Value Transfer System (LVTS), the system was launched in February 1999.

The guarantee works in two ways, according to CPA general manager Bob Hammond. First, participating banks put some money on deposit at the Bank of Canada, which acts as a central clearinghouse.



AL PEACOCK/IN-A-BOX

THE CANADIAN PAYMENTS Association's Bob Hammond says the group's money transfer system helps Canada's banks make time-sensitive transactions

There must be enough money to ensure that all transfers out of the bank's accounts — minus the amount of transfers to the bank — are guaranteed. Second, each member bank pledges a certain amount of money into a kind of insurance account or short-term loan system.

Accounts are still settled at the end of the day, however, and Hammond says there are no immediate plans for real-time settlement.

At first, Hammond says, he expected that the LVTS — which is more expensive than writing an ordinary check — would be used for transfers of \$50,000 or more. "But we're finding that 50% of payments are for less than \$50,000," he says.

Today, reflecting the value the LVTS provides banks and businesses, some \$100 billion goes through the system each day, Hammond says, compared with a mere \$20 billion through the old non-secured network, the Automated Clearing Settlement System.

Only 15 of the largest banks in Canada belong to the LVTS, Hammond says, but they in turn offer access to the system to smaller banks. Bank of America Corp. in Charlotte, N.C., was one of the first to join and uses LVTS to offer its own branches worldwide, as well as other banks, access to Canada's financial system.

"It is an extremely efficient, fast and sound way for us to offer our clients finality of payments," says Susan Roberts, vice president of Bank of America's Canadian branch operations. She says the system was one of the top five worldwide, and it was installed at just the right time.

"It allowed us the time to get ready internally for it to come," Roberts says. Members have to invest in back-office computer equipment and dedicated terminals, Hammond notes.

The limited access and dedicated lines help make the entire system more secure, he added. "We have the latest security arrangements," he says.

When LVTS was launched last year, it brought Canada in line with other industrialized nations, many of which, including the U.S., have systems that provide certainty of settlement and finality of payment, Hammond says.

"This is extremely important in making the important and time-sensitive payments that are involved in major business transactions and international trade," he says. ▀

COMPUTERWORLD

Smithsonian Awards 2000 Finalists

Continued from page 43

National Marrow Donor Program's Search Tracking and Registry system improves the outcomes of this complex procedure.

Science

■ 3D design tools from **Hawkes Ocean Technologies'** Deep Flight Project enabled the creation of a small, inexpensive submersible craft that can take scientists deep into the ocean, making the exploration of this vast resource economical for the first time.

■ **IriScan Inc.'s** iris-recognition technology allows for secure biometric identification through recognition of the unique patterns in the iris of the human eye, eliminating the need for passwords and other forms of identification that are readily compromised.

■ Through the **National Cancer Institute's Advanced Biomedical Computing Center's** Computer Simulations of Proteins and Enzymes Involved in Cancer and AIDS project, computer simulation of the behavior of an enzyme implicated in cancer opens the door to the design of a drug that would block its activity and provides a model for future drug discovery.

■ Advanced algorithms and high-performance supercomputers from the **Naval Research Laboratory's** Eddy-Resolving Global Ocean Modeling and Prediction project enable the prediction of ocean behavior and set the stage for future forecasts that will be accurate weeks, months and, perhaps, years in advance.

■ More than 1 million home computers process astronomical data in their spare time through the **University of California at Berkeley Space Science Laboratory's** SETI@home Project, achieving an aggregate processing speed 16 times that of the largest traditional supercomputer and representing the world's largest use of distributed computing.

Transportation

■ An integrated digital network at **Delta Air Lines Inc.** collects data, records events and automatically pushes accurate, up-to-the-minute information to employees and passengers, giving them the information they need before they ask for it (see story, page 43).

■ The world's busiest rail system, that of the **Ministry of Railways, The People's Republic of China**, provides coordination and distribution of tickets from a central client/server system, expediting the travel of 4 million passengers per day.

■ Through **PSA Corp.'s** CITOS project, the world's largest container transshipment hub routes more than 10 million containers each year from one ship to another by completely automating the process and loading and unloading ships at a rate of three containers per minute.

■ Electronic airline tickets from **United Air Lines Inc.'s** information services division provide the speed and flexibility of instant ticketing and eliminate the worry of lost, forgotten or stolen tickets.

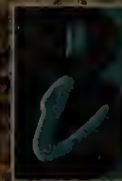
■ The combination of a three-tier client/server architecture and object-based technology from **VR Group Ltd.'s** ticket sales system provides a single point of service that customers can use to access all rail services.

Unlocking the mysteries of eBusiness.

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What would you do if marketing could update the Web site on its own?

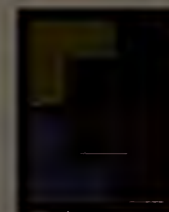
"I'd finish the transaction engine implementation."

"I'd look at integrating new servers with our legacy systems."

"I'd review our site security systems."

"I'd stop hiding from marketing and customer service and sales and...."

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BUSINESS

MOM-AND-POP SOFTWARE

When Honda Trading America Corp. needed new software to manage its steel and aluminum supply chain, it turned to Blinco Systems, a 12-person, family-run software developer in Toronto. Like Blinco's other customers, Honda — which does \$1.2 billion in business annually — says the company's small size actually offers added benefits. ▶ 50

EXECUTIVE SHUFFLE

CIOs are making their way to the executive suite. As IT continues to play a larger role in business, more companies are tapping their IT directors to head up dot-com spin-offs, and corporate CIOs are taking CEO slots at new Internet marketplaces. It's a natural move, analysts say, in a world in which technology changes every day. ▶ 52

BIDDING WARS

The ongoing battle between eBay and Bidder's Edge could have a major effect on the future of both businesses as well as the Internet in general, say analysts. They warn that whatever the outcome, the case will force a serious debate about legal boundaries and access to information on the Web. ▶ 54

ONSTAR GROWTH

GM recently announced an agreement with Honda to license its OnStar Global Positioning Sys-

tem for use in Acura luxury-model cars. GM is hoping that leasing its technology to competitors can help boost its revenue from \$61 million this year to \$2.3 billion in 2005. ▶ 55

WORKING AT 'WINNIE'

In Forest City, Iowa, population 4,500, Winnebago Industries is just about the only IT shop around. Joel Albertson, senior computer analyst at the motor-home manufacturer, tells what it's like to work in the IT department, or what employees affectionately refer to as the "doghouse," of this rural company. ▶ 56

BEST PLACES TO WORK IN IT

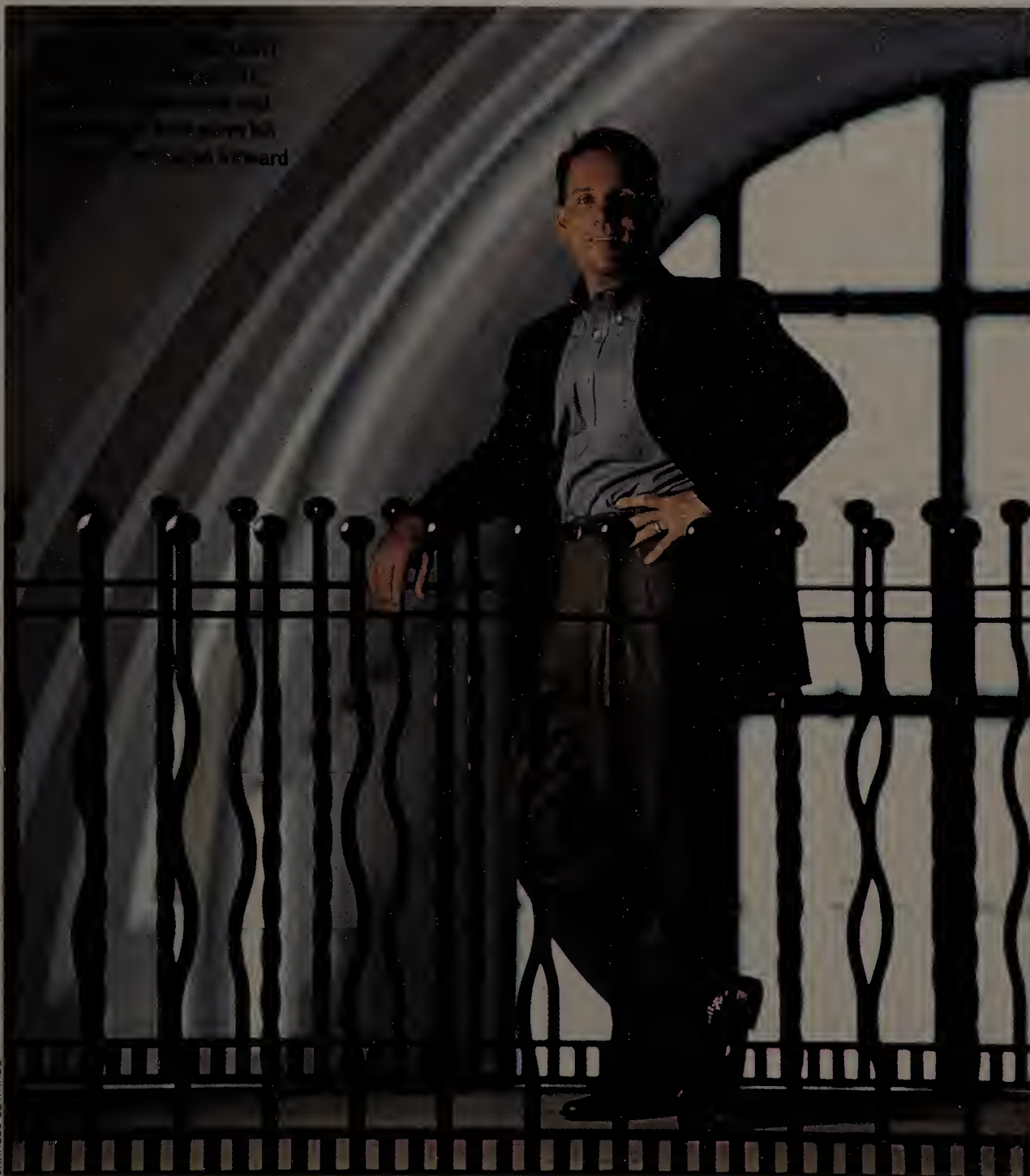
The results are in. *Computerworld's* Seventh Annual Best Places to Work feature lists the top 100 companies at attracting and retaining IT talent. Find out what these leaders do to keep employees happy and on the job. ▶ 61

UCITA STORM

Since its inception four years ago, the Uniform Computer Information Transactions Act has prompted a storm of controversy. Many say the legislation gives vendors an unfair advantage. But proponents insist it's simply aimed at creating consistent rules for software licensing and contracts. ▶ 72

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CHARLES EDWARDS

THE CHALLENGES OF E-MARKETS

ONLINE BUSINESS-TO-BUSINESS exchanges have been catching on in most major industries. Automakers, utilities, retail outlets and chemical companies are combining power and resources to bring down prices from suppliers and speed up delivery. But just as they've been gaining steam, these marketplaces have been raising several questions, ranging from planning to logistics to staffing to legal boundaries.

58

Mom-and-Pop Approach Works for Developer

Despite its small size, clients swear by family-owned supply-chain software firm

BY LINDA ROSECRANCE

WHO SAYS bigger is always better? Certainly not the customers of Toronto-based Blinco Systems Inc., a 12-person, family-owned and -operated developer of international supply-chain and distribution software called 3rdWave and 3rdWave Logistics.

Take for example Honda Trading America Corp. in Marysville, Ohio. The international importer and exporter of steel, aluminum, plastic raw materials and automotive parts must balance its supply needs with the manufacturing, assembly and processing requirements of its many domestic and international partners.

Why would a firm like Honda Trading America, which is jointly owned by Honda Trading Corp. and American Honda Motor Co. in Torrance, Calif., and does more than \$1.2 billion in business annually, choose to work with a firm as small as Blinco?

Because Blinco is a small company, said Blair Fujii, Honda's senior assistant manager of information technology.

"They can rapidly [adapt] the software as our business changes," said Fujii. "And they can do it rather quickly, sometimes within three months. It's that flexibility that sets them apart."

Homegrown Software

Edward "Ned" Blinick, who runs Blinco Systems with his brother, David, said the company grew out of the family's international food importing and distribution business, which he and David started in 1982.

While that business was in operation, the brothers decided to develop a system to manage its supply-chain logistics. Then in 1994, realizing that the

software business they began two years earlier was more profitable than the food business, they decided to devote themselves and their five employees full time to the software business.

Despite its size, Fujii said, Blinco Systems' operations are compatible with Honda Trading America's needs.

In 1993, Fujii said, when Honda Trading America decided it needed to become a complete supply-chain organization in order to be a more effective business, it began looking around for a company that could develop just the



ROTHCO SYSTEMS DIRECTOR ANTHONY PROSSI: "We were a little nervous because they were so small, but they proved they could deliver"

Today, Blinco Systems employs just 12 people: David, who is president and CEO; Ned, who is vice president; eight programmers; and two implementation specialists.

Ned Blinick said the company, which currently has 15 active clients, is looking to add two or three more programmers and a salesperson within the next several months.

Staying small allows Blinco Systems to develop totally "client-centric" products, he said, explaining that the company can easily adapt its software to fit its customers' needs without having to reinvent the wheel. But if Blinco lands more customers, the Blinicks understand the company will have to grow. The question is how much.

right software to allow the firm to manage its entire steel and aluminum supply chain.

"We looked at large companies like Big Blue [IBM] and smaller firms," Fujii said. "We needed a company that could move quickly and could speak our language."

And Blinco Systems fit the bill, Fujii said. Even though the company was small — four people in 1993 — it was willing to send someone to Ohio to learn about Honda Trading America's business, he said.

"They came and spent time talking to people, especially those closest to the project, the people who key in the data. And they were quick studies," Fujii said. "They listened to the process and understood what is important to our busi-

ness. Working with Blinco Systems is like working with a true partner, not a purveyor of services."

Anthony Prossi, director of information systems at Rothco, a global importer and exporter of military-type apparel and accessories, agreed Blinco Systems knows how to deliver quality to its customers.

Change of Heart

"Originally when we set out to look for software, we were looking for a larger company with a more established customer base," Prossi said. "But we were also looking for a company that could fill certain needs, like being able to handle Rothco's rapid-ordering system."

Rothco, which does about \$55 million in business annually, also wanted an integrated system to handle its import and export sales needs.

The problem, Prossi said, was that Rothco couldn't find a company that could integrate all its back- and front-office requirements.

What Rothco needed was a company to customize its software to Rothco's business, something large companies are generally unwilling to do, Prossi said.

"Large companies were more interested in you adapting to their software," Prossi said. "But Blinco Systems custom-tailored its software to our needs."

"We were a little nervous because they were so small, but they proved they could deliver what they promised," he added. "We've been running live with their full system for a year now, and it has exceeded our expectations."

Options

John Fontanella, an analyst at Forrester Research Inc. in Cambridge, Mass., said 3rdWave can do far more than other supply-chain software systems available.

"There aren't many other [systems] that have the level of functionality that 3rdWave

has," he said. "The company has an impressive list of users for its size and is well worth a look if you seek an integrated suite to manage domestic and international trade."

Not only does Blinco Systems understand the needs of large and medium-size businesses, but it can also handle the requirements of much smaller companies.

Philip Khazzam, president of family-owned Totally Nuts, a Montreal importer of nuts and dried fruits that does about \$10 million to \$12 million in business annually and has five employees, said Blinco Systems has a firsthand understanding of the challenges facing small firms.

"When we heard they were going into the software business, we said that because they came from a small, family-owned food business, they would understand our needs," Khazzam said. ▀

3rdWave

Blinco Systems' supply-chain software:

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More Techies Moving Up to Executive Suite

Corporate CIOs finding new jobs as dot-com CEOs

BY JULIA KING

CARL BASS used to spend the better part of his working day developing software. Now, he can usually be found in the company of customers, industry analysts, reporters or venture capitalists.

Bass, CEO of Buzzsaw.com Inc., is among an increasing number of CIOs, information technology directors and software development professionals launching second careers in the executive suite. They're becoming CEOs at their companies' dot-com spin-offs or at new Internet marketplaces.

Bass said he's a natural choice for an online CEO slot.

"In this world of hosted applications and [digital] marketplaces, a huge part of the deal is getting the IT infrastructure correct, which is something that has been the lifeblood of CIOs for years," Bass said.

Exact numbers are hard to come by, but individual examples of CIOs-turned-CEOs abound. High-profile companies such as Chicago-based W.W. Grainger Inc., Atlanta-based Delta Air Lines Inc. and Detroit-based General Motors Corp. have all shifted technology experts into either CEO

slots at Internet start-ups or top electronic-business strategy positions during the past 18 months.

New Internet marketplaces are following suit. A prime example is Bass' Buzzsaw.com in San Francisco, a business-to-business exchange that lets architects, suppliers and builders collaborate on projects and trade goods and services online. The 3-month-old start-up is a spin-off of San Rafael, Calif.-based Autodesk Inc., a developer of computer-aided design software and other applications.

Bass, Autodesk's former chief technology officer, said he understands the need to invest heavily in IT.

"My question often to the IT team here is, 'Are we spending enough?'" he said. "We have hit upon a market opportunity where the failure of our IT systems is one of the things that could really cripple our ability to succeed. ... Not to do the appropriate things in IT is just inexcusable."

Abbas Syed spent 12 years developing e-commerce software at Hewlett-Packard Co. and Sun Microsystems Inc. before becoming CEO of Mountain View, Calif.-based OneBuild Inc., a new Internet procurement marketplace for the commercial construction industry.

"It's easy for people with a technology background to grasp the business part of things and combine the two," Syed said. "But for people who come purely from the business side, it's harder to leverage technology to better direct the business. The reasons are that the technology is so complex and it is changing every day."

That makes sense to business expert

Not to do the appropriate things in IT is just inexcusable.

CARL BASS, CEO,
BUZZSAW.COM INC.



Thornton May, vice president of research at Cambridge Technology Partners Inc. in Cambridge, Mass.

"In this rapidly changing world where your business model changes every six weeks, the people most comfortable working with those changes are those from the technology community," May said.

Still, the transition hasn't been without its challenges.

"There was a steep learning curve I had to go through," Syed said. "For example, I didn't understand how to do market segmentation. But learning is a part of life."

Not every CIO-turned-CEO will face the same steep learning curve, said Michael Boyd, an analyst at International Data Corp. in Framingham, Mass.

"The people running off to run dot-coms may come from the CIO ranks, but they may also have had sales and marketing and other business experience," he said. ▀

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U.S. Judge Blocks Web Bot From eBay Site

BY LINDA ROSENCRANCE
AND MELISSA SOLOMON

Online auction sites eBay Inc. and Bidder's Edge are at the

center of a fierce war, but this one won't be won by the highest bidder.

On May 24, U.S. District

Court Judge Ronald Whyte barred Burlington, Mass.-based Bidder's Edge from using an automated system to

search eBay on the grounds that it could slow the auction giant's site. The injunction goes into effect June 8.

By week's end, Bidder's Edge had appealed the decision in San Jose Federal District Court.

The stakes are high for both companies, and the outcome could weigh heavily on their futures, said analysts.

"eBay, as the gorilla in online auctions, has captured a majority of the auction content on the Internet," said Vernon Keenan, an Internet analyst at Keenan Vision Inc. in San Francisco. eBay is fighting aggregator sites to retain control of its community of bidders and content, he said.

The decision could also have broader implications for the openness of the Internet, because it relies on laws against trespass, not copyright infringement.

Jonathan Moskin, an intellectual property lawyer at New York law firm Pennie & Edmonds, said the judge's ruling expanding the definition of trespassing on physical property to include the Internet is controversial because it has never been applied online.

The war began back in December, when eBay filed suit against Bidder's Edge, claiming that it violated eBay's copyrights and intellectual property. Bidder's Edge is one of many auction aggregator sites that search various online auctions with software robots, then report the results to customers.

In February, Bidder's Edge countered eBay's suit with its own antitrust lawsuit, alleging that eBay is trying to monopolize the online auction market.

The U.S. Department of Justice antitrust division is investigating the matter.

Whyte's 22-page ruling last month was very narrow. In his order, he denied eBay an injunction based on its allegations that Bidder's Edge violated its copyright and trademark rights. Instead, he said, Bidder's Edge can't search eBay's database using a software robot because it could disrupt eBay's system.

"The law recognizes no such right to use another's personal property," Whyte wrote.

But he didn't preclude Bidder's Edge from accessing information from eBay by other means.

Keenan backed Whyte's opinion, saying that eBay has a right to shield its content.

"I don't think that there is any public domain right to that information that eBay's collected," he said. "I think they have the right to protect their business." ■

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GM Now Sells Web Technology, Not Just Cars

BY LEE COPELAND

In a bid to drum up a new income stream, General Motors Corp. recently licensed its OnStar communications technology to rival Honda Motor Co.

GM will also provide services such as emergency roadside assistance to Honda customers.

Under the deal, Tokyo-based Honda will equip its 2002 Acura RL luxury sedans with the OnStar in-vehicle communications system and services. Financial details weren't disclosed, but officials said other Honda vehicles could be added to the licensing agreement.

Using Global Positioning System (GPS) and cellular technology combined with an around-the-clock service center, OnStar provides emergency roadside assistance, stolen-vehicle tracking and concierge services. The GM subsidiary also plans to offer other e-commerce services this fall.

Detroit-based GM hopes to groom OnStar into a major source of income. Chet Huber, OnStar's managing director, forecast OnStar's revenue to grow from \$61 million this year to \$2.3 billion in 2005. Last year, the world's largest automaker posted income of \$6 billion on revenue of \$177 billion. But more than one quarter of GM's profits came from GM Acceptance Corp., its financial services wing, a sign of how important it is for GM to develop new revenue sources.

"GM built an infrastructure that can be used like an ISP and they can repurpose it for other services," said James McQuivney, an analyst at Forrester Research Inc. in Cambridge, Mass.

Annual subscription fees for OnStar start at \$199 for basic emergency services. It costs \$399 for additional travel and concierge services.

Ford Motor Co. in Dearborn, Mich., and DaimlerChrysler AG in Stuttgart, Germany, have similar offerings.

Ford offers in-vehicle navigation and emergency communication services in Lincolns, Jaguars and Volvos and will offer services under the Lincoln Rescu service through Sprint PCS Group in Kansas City, Mo., this fall. But Ford hasn't decided on licensing to other

manufacturers, said spokeswoman Fara Warner. DaimlerChrysler spokeswoman Ann Smith said the company has no

plans to license the Tele-Aid roadside services and the Command navigation systems available in Mercedes-Benz ve-

hicles, but added, "We would not rule [licensing] out."

Thilo Koslowski, an analyst at Gartner Group Inc. in Stamford, Conn., said putting cellular and Web services in vehicles fills a gap.

Koslowski said offering OnStar in more-expensive Acura vehicles was a good strategy, since consumers of lower-end vehicles, such as the Honda Civic, would be less likely to purchase the service. ▀

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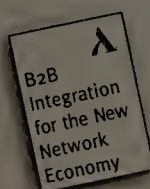
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WORKSTYLES

What It's Like to Work at ... Winnebago Industries Inc.

Interviewee: Joel Albertson, senior computer analyst, technology support staff

Company: Winnebago Industries Inc., a motor home manufacturer

Main location: Forest City, Iowa; population 4,500

Number of information technology employees: 35
Number of employees (end users): 3,200 in Forest City plus 300 at three manufacturing plants across the state

Tenure: Fifteen years. "There aren't really any other IT shops in town."

How difficult is IT recruiting? "The locale is a problem. We recruit from cities like Minneapolis and Chicago. You have to like rural life. There are people who want to live in a smaller community, and this one has a lot to offer - fishing, hunting, camping, biking, hiking."

Cost of living: "A typical four-bedroom home is about \$80,000 to \$90,000."

Critical IT initiatives: The majority of the IT staff (about 20 people) are programmers maintaining and improving a mainframe-based, homegrown manufacturing system for motor home production. The remainder of the staff is in operations and PC technical support, supporting 800 PC users ranging from robotics and computer-aided design and manufacturing users to field sales reps.

What's your role? "I wear many hats - tech support, network administration, Web site"

Dress code: Business casual, with casual Fridays

Workday: "Oh boy. We are a 24/6 shop, and we have three shifts in IT. The only day we're not staffed is Sunday. My office is mainly on from 7:30 a.m. to 4 p.m., but we usually stay longer because of demand for user support or project deadlines."

Do you need a security badge or card to get into the building or office? "We have three car gates into the complex with security when you drive in and one security dog. We have a tremendous amount of inventory here - both finished products and components - so we have to make sure things don't leave without authority."

IT facility: "Back in the early

'70s, Winnebago had 12 security dogs, and this is where they were housed. It was expanded and remodeled for IT, but it's still referred to as the doghouse. And we can bark up a storm."

What do you see in people's workspaces? "A lot of golf balls and miniature putting greens; miniature motor homes are pretty popular - you can find all sorts of them on eBay. But we have policies about eBay usage; we observe what people are doing on the Net."

IT Training: "I always attend the big trade shows and all the Microsoft seminars."

Employee reviews: Annually
Internal career paths: "There are more people wanting to move from other business areas into IT than the other way around. Once people are in IT here, they want to stay in IT."

Must people carry beepers?
Cell phones? Yes. "In operations and tech support, we're basically on call all the time."

Number of IT employees who telecommute: None
On-site day care? No
Did you ever imagine that the phrase *The Winnie* would be part of the vernacular among 18- to 24-year-olds? "We did the MTV *Road Rules* thing to get the name recognition - to get the persona out there that motor homes are cool for all ages. And it's worked well."

Perks: "We have an employee fleet of Winnebagos, and in the summer you can put your name in for drawings to use a motor home on the weekends." Employees can buy motor homes at cost.

The company also reimburses 75% of tuition costs, and a computer purchase program allows employees to make interest-free payments on home PCs through paycheck deductions.

IT activities: An annual camp-out for IT staff and families on the Mississippi River in Wisconsin in June, golf tournaments and weekend bike trips

Would employees feel comfortable e-mailing the CEO, Bruce Hertzke? "Oh, sure. I don't think he'd reply for a while, but we'd feel comfortable sending him one."

- Leslie Goff

PAUL A. STRASSMANN

GM's info gamble

THE NEWS THAT General Motors, one of the nation's richest corporations, is turning itself into "the world's largest e-commerce company" [News, April 17] could affect the ambitions and plans of every corporate IT department.

The nation's top automaker announced that it would move into the worlds of online mortgages, cellular services and information delivery. GM also announced that it would sell its vehicle-based

Internet technology to other automakers.

As is the case with every computer-oriented publicity campaign, the rhetoric and new profit-promising visions permeate everything that GM has so far generated about its plans to also become a "new economy" company instead of continuing to be identified only as an "old economy" maker of vehicles. The idea is to "grow profits, expand relationships, drive up revenues and the stock market price" with ventures such as selling customers Global Positioning System and cellular technology services. It sounds good and enticing, but I'd like to better understand how well GM is doing in the automobile business it has known for 70 years before it shifts into the volatile world of the information marketplace.

My first take on this was from the shareholders' standpoint: How well has GM managed its shareholder equity? It's discouraging. During a recent period of unprecedented prosperity and growth in the values of giant U.S. firms, the company's shareholder equity has declined from \$23.3 billion in 1995 to \$15.1 billion in 1998, recovering to only \$20.6 billion last year. That's why GM may be pursuing the information business: It needs more profit to boost shareholder value.

With last year's revenue of \$177 billion, it would take an enormous increase in revenue and profit for GM's information services business to make up the difference between its current financial results and the spectacular profit growth that some of the leading information services firms have shown. For such expecta-

tions to be realistic, look at other indicators of GM's demonstrated superiority.

How well does GM manage its information expenditures? One way to tell (see chart) is to examine how much information overhead —

research and development, sales and general and administrative expenses — is needed to coordinate operations that produce and deliver tangible products or the cost of goods sold. The results are discouraging. As the table shows, the ratio of information costs to the cost of goods sold has crept up from 11.5% to 14.9% during the past three years.

The steady rise in information costs, which can be traced back to 1990, raises doubts about GM's claims that it has made gains from imaginative uses of IT, from e-commerce and improved computer utilization.

To comprehend the significance of the 3.4% rise in the overhead ratio, realize that GM's ratio of net profits to costs is only 5%. Consequently, for GM's entry into the information services business to generate better profitability, it may have to first overcome its steadily rising internal information costs. That would be necessary before it could hope to reap significant profit gains in a marketplace already dominated by highly efficient and entrenched competitors.

CIOs are feeling an urge to extend their influence from just tending internal information operations to becoming agents of so-called strategic repositioning of their firms. There's no clear connection between adding information value to existing operations and further diversifying a company into the information business.

My advice to ambitious CIOs: Don't divert significant energies and resources into risky marketing ventures unless the fundamentals of the existing operations are already well under control. ▀

Strassmann (paul@strassmann.com) once almost succumbed to the temptation of using a former employer's IT shop as the base for a commercial venture.



Higher Information Costs at GM

	1996	1997	1998	1999
Costs of information	\$14.6	\$14.8	\$15.9	\$18.8
Cost of goods	\$123.2	\$128.2	\$114.5	\$126.8
Ratio of information costs/cost of goods	11.8%	11.5%	13.9%	14.9%

SOURCE: GENERAL MOTORS CORP. FINANCIAL STATEMENTS



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IT organizations can help an electronic marketplace succeed, but they can also stand in the way of progress. IT staffs not only must make the exchange work, but they also have to solve problems like getting potential suppliers on board and helping to straighten out thorny legal and ownership issues. By Kim S. Nash

ELECTRONIC MARKETS, or business-to-business exchanges for selling goods and services online, have been exploding in number during the past several months. Hundreds have been launched to support players in the automotive, chemicals, retail and other industries, with an eye toward using their collective buying clout to get supplies more cheaply and quickly. Suppliers, too, stand to save money via the streamlined, all-electronic procurement process.

But despite the promises e-markets offer, they face major obstacles before they can be branded successful.

Among the obstacles are having information technology staffs stuck in megaproject mode for e-market rollouts more akin to giant enterprise resource planning (ERP) system efforts, inducing suppliers to use the exchanges and working through big technology integration issues with all members of the exchange.

Then there are potentially big legal potholes — namely, antitrust violations — that experts say may be inherent in doing this sort of business online. The Federal Trade Commission (FTC) has scheduled a meeting June 29 in Washington to discuss concerns such as whether owners of major e-markets may be able to shut out smaller competing exchanges or if the electronic open-bid process may lead to illegal price signaling.

E-markets are generating more questions than transactions right now.

"We're definitely at the stage in this whole thing that people keep inventing as they move along. And some are better inventors than others," says Vernon Keenan, president of Keenan Vision Inc., a San Francisco-based researcher.

Obsolete approaches to IT are also stalling many e-markets, says Kevin Costello, managing partner of the digital markets practice at Arthur Andersen LLP in Atlanta. "Landing three busloads of consultants in a building and setting them up for two years is not a winning proposition," he says.

"This isn't ERP," IT managers, he says, should instead plan short, intense project bursts of just a few months, tops.

That's the way it worked at FuelQuest Inc., a Houston-based petroleum exchange. The company chose software — mainly from Oracle Corp. — and didn't look back, says Rich Cilento, president and CEO of FuelQuest, which is due to go live Aug. 1.

FuelQuest is aimed at marketers of gas and other fuels — companies that, for example, deliver to gas stations and such big commercial users as Dow Chemical Co. At FuelQuest, petroleum marketers will be able to order fuel, arrange delivery and take care of electronic invoicing and other logistics. Fifteen companies have signed up so far.

Before joining FuelQuest in Stamford, Conn., Cilento founded a company called The Bollard Group, which installed technology for investment bankers. He also did an IT management stint at Xerox Corp. and helped rebuild the mission control system at NASA.

That kind of heavy-duty technology background is something many e-market CEOs don't have but need, says Chris Silva, an analyst at International Data Corp. in Framingham, Mass.

"A lot of the marketplaces out there now are leaning on the content side, but that won't get them far," Silva says.

For example, ManufacturingCentral.net, which is overseen by the National Association of Manufacturers, a trade group in Washington, doesn't conduct transactions yet; it's in the middle of installing the technology infrastructure to do so. Active buying and selling is expected late this year. In the meantime, it provides industry news and community chat space.

Another problem for owners and operators of e-markets is muscling suppliers onto the exchange. Small and midsize suppliers, in particular, often don't have the IT infrastructure needed to participate in e-markets; some have almost no computer systems at all. Costello advises e-market owners to pay for any new gear that suppliers need. Owners should also pay for consultants — or lend their own IT people

Top B-to-B Exchanges

Though hundreds of e-markets exist — and hundreds more are expected to materialize — just 50 to 100 will survive to the end of next year, AMR Research predicts. Here's a look at the top five:

RANK	EXCHANGE	BUSINESS
1	Altra Energy Technologies altranet.com	Sells to utility companies
2	Ventro Corp. ventro.com	Builds vertical market exchanges on the Web
3	CheMatch.com chematch.com	Chemicals, fuel and plastics
4	SciQuest.com sciquest.com	Scientific products, science news to medical and science companies
5	PlasticsNet.com plasticsnet.com	Materials, news for plastics industry

SOURCE: AMR RESEARCH INC. IN BOSTON AND COMPUTERWORLD RESEARCH

— to install it. This will help smooth political feathers and coax suppliers to participate, he says. Plus, it will help make the exchange successful, or more "liquid," with many buyers and sellers.

Meanwhile, exchange owners must overcome other political issues. Most critical, says Keenan, is explaining just how the new electronic process benefits suppliers. "If exchange ownership is dominated by buyers only, then this is merely a year 2000 update to the decades-old practice of squeezing the supply chain," he says.

For example, Covisint, the e-marketplace owned by the Big Three automakers, will have a tough time convincing suppliers to use the site, Keenan says. "If it's just a way to get competitors to reveal their pricing, there's not much value in it for suppliers," he says. Indeed, in a countermove, six major auto parts suppliers, including Delphi Automotive Systems Corp. and TRW Inc., recently announced their own e-market. It's expected to go live this year.

Vital to any exchange will be the cooperation of companies that are oth-

Reality Check

erwise fierce rivals. For example, exchange owners will have to share proprietary pricing and other information that they have historically been reluctant to share with competitors.

Several experts suggest appointing alliance managers from both the business side and IT. Both should be well-versed in antitrust law, because the FTC and the U.S. Department of Justice are scrutinizing e-markets.

"Anytime there is some kind of purchasing joint venture among competitors, it has the potential to raise anti-

trust issues," says Susan DeSanti, director of policy planning at the FTC in Washington. In particular, the FTC will look for signs of illegal cooperation at exchanges created by companies that clearly dominate a given market, DeSanti says. "We will ask, 'Is this an exercise of market power that will have an impact on competition?'"

Perhaps the most critical question for IT is whether the technology itself will exacerbate antitrust problems.

Here's one scenario: Buyer A wants 2 tons of iron and posts a proposal at

an online exchange. A supplier bids on the business. The supplier's competitors see the bid and undercut it. The process continues, with the price for the iron eventually settling at the lowest point the suppliers are willing to go. Buyer A buys. Buyer B, also in the market for iron, watches the action and now knows roughly how the bidding will go. So, too, do the suppliers.

Ultimately, the suppliers become cautious, not necessarily rushing to offer cut-to-the-bone pricing just to win business. They watch what everybody else does, taking advantage of this new electronic window into a process that used to be done more discreetly with paper, phones and personal meetings.

The suppliers can now interpret the bids and adjust theirs accordingly.

This sort of price signaling may seem like smart business, but it violates antitrust laws. And yet it may be a natural outgrowth of e-market technology. "The same potential is there in all of these exchanges, where it's not explicit, but implicit, that you're cooperating," says Mark Plotkin, an antitrust lawyer at Covington & Burling in Washington.

Another potential problem is exchanges like Covisint that are formed by an industry's top players. By coming together in such ventures, these firms may seem to present an overaggressive, "do this or else" posture to their suppliers and stifle competition from less powerful rivals.

That's part of what the FTC wants to uncover. The agency is already investigating Covisint, which is due to launch late this year. "Because of the technological differences with these kinds of marketplaces, as opposed to physical marketplaces, they may raise some new [antitrust] questions we haven't thought of before," DeSanti says.

Ford Motor Co. CIO James Yost says he's trying to guard against breaking antitrust laws. For example, Covisint plans to ensure that no member owns a bigger share of the new company than any other member, he says. "The key," Yost says, "is creating [the marketplace] as its own entity. It can't be tied back to any of the owners." ▀

Ducking the Feds

Now that mortal enemies are pledging to work together through Internet exchanges, the potential for them to act anticompetitively is ripe.

Yet popular vendors of e-market software, such as Oracle, Ariba Inc. and Commerce One Inc., haven't built any functions into their products to guard against antitrust problems, says Mark Plotkin, an antitrust lawyer at Covington & Burling.

"This wasn't on their radar screen when they developed the software," he says.

But IT managers can configure and customize exchange software to help avoid having federal enforcers swoop in.

To protect against unintentional cooperation in setting prices, Plotkin and other experts recommend generating code names or numbers to disguise members' identities during the bidding process. Also, don't forget to shield from public view other identifying data, such as location of the bidder or origin or destination of the product being bought.

For instance, if your big agricultural competitor is in Austin and you see that 1 million bushels of apples are coming from Austin after a request for proposal, the math is pretty easy to do.

To ensure that all exchange members get equal access to potential business, experts also suggest posting bids immediately to let other bidders react quickly. That way, they are less likely to claim they were shut out of a potential deal.

To avoid the appearance of collusion, chat rooms should be monitored. This is tough because even innocent conversation can spark antitrust trouble, Plotkin says. IT organizations for exchanges should also create and post automated reminders of what is acceptable chat and what isn't, he says.

Plotkin gives an example: "Imagine the Vermont dairy farmers. Someone posts, 'I was the one who supplied milk to Ben and Jerry's, at 67 cents per gallon. I'm pretty sure we can get at least 75 cents if we all agree.' That's inappropriate," he says. — Kim S. Nash

FUELQUEST'S heavy technology background may be a big lift for e-marketplace FuelQuest, which is scheduled to debut Aug. 1



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RON GRIFFIN, CIO at The Home Depot: "We try to involve our [employees] in all aspects of the biz, and not just treat them as technonerds"

100

BEST PLACES TO WORK IN IT

From training to technology to career planning, the top IT employers invest heavily in staff. Though that makes their employees more marketable, the risk is worth it to gain more loyal and satisfied employees. **Page 64**

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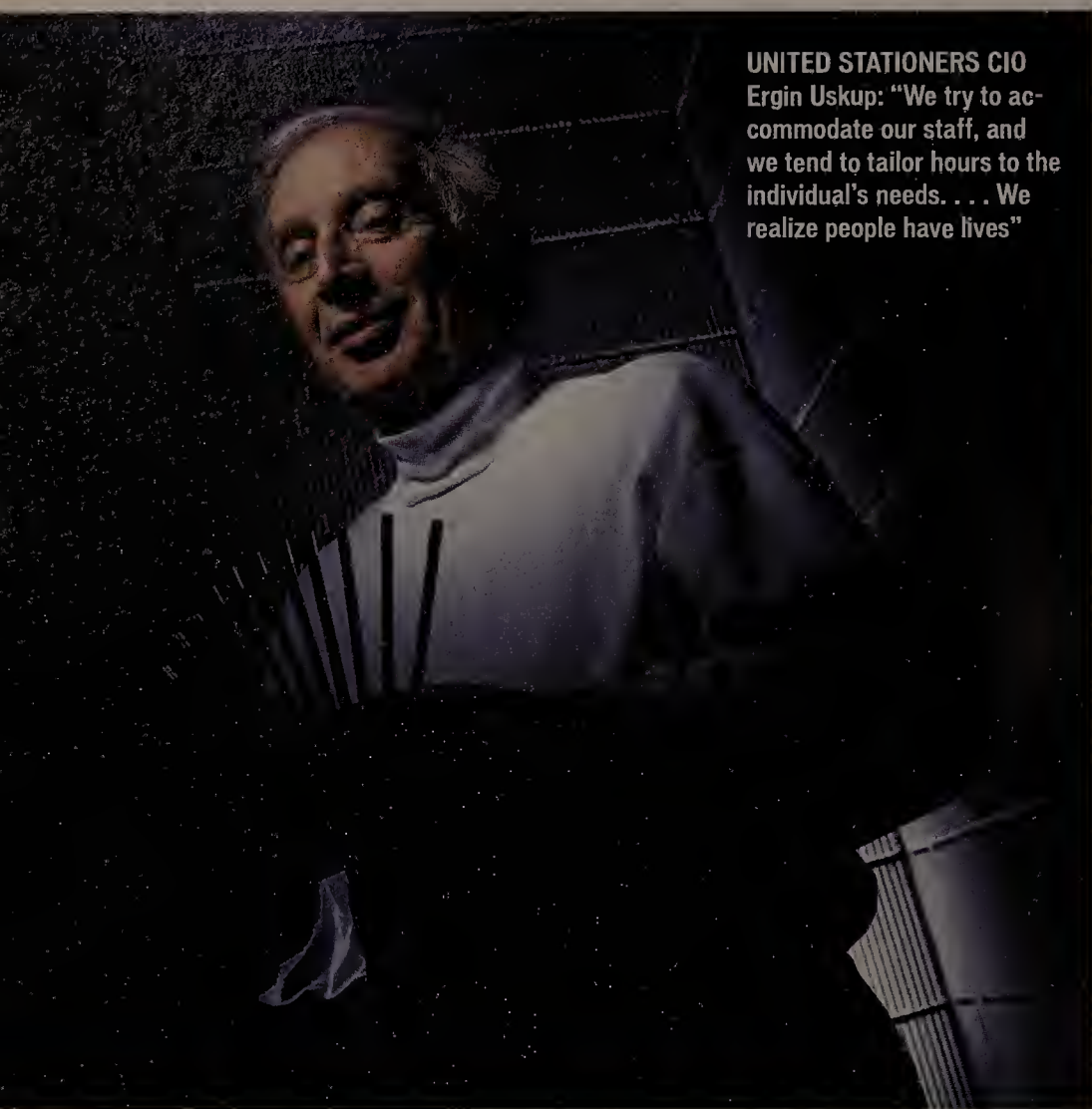
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Ergin Uskup: "We try to accommodate our staff, and we tend to tailor hours to the individual's needs. . . . We realize people have lives"

ANDY GOODWIN

THE NEW SUCCESSFUL WORKFORCE

The best IT employers know that the key to finding and keeping talented workers is to listen to their ideas, invest in their careers and be flexible with their jobs.
By Lee Copeland

IF YOU'RE GOING TO style your business for the Internet, you're going to need IT talent. And right now, demand outstrips the supply of good technologists by far, making it tougher than ever to retain staff.

That means information technology managers must focus on cultivating top performers and motivating them into staying onboard rather than chasing after bigger paychecks elsewhere. While there are numerous tactics that companies can deploy to keep their best and brightest — from extending inflated counteroffers to chaining them to their workstations — the most effective

strategy is keeping employees from wanting to jump ship in the first place.

By all accounts, compensation remains the key to opening the door to a job candidate's commitment. IT professionals know what they're worth and aren't afraid to demand competitive pay.

But keeping the people you recruit from going back out that door involves much more than cold, hard cash. At the companies that qualify as *Computerworld's* Best Places to Work in IT, consensus-building management styles, commitment to professional training and flexible working arrangements help keep IT staff content and turnover low.

Squeaky Wheels Get the Grease

Bill Meadors wants to learn Spanish. In the next few weeks, Meadors, lead systems analyst at TECO Energy Inc., a public gas and electricity utility in Tampa, Fla., will start a beginning Spanish course at a local community college.

Currently, Meadors doesn't need to speak Spanish at TECO. But he says he's looking ahead to possibly working with TECO's Guatemalan subsidiary, or moving into a business development role that would involve working with Hispanic commercial accounts.

"We don't have to have just technology training," says Meadors. "As long as the company can see the benefit for the business, it's OK. Who's to say two to three years from now I won't be in IT, but in some other part of the business?"

Joseph Wiley, TECO Energy's CIO, says offering training that takes into account the company's needs inside IT — and the employee's long-term plans outside IT — involves risk: The trained employees may update their résumés and bolt.

But Wiley says he believes these types of expanded training opportunities create more motivated employees. He says it helps build company loyalty, even if the employee moves to another department later in his career.

"If someone comes to work in an IT function, then decides they want to be in marketing or in the power plant, there is a semiannual process review and those goals get factored into their work objective," explains Wiley. "We try to focus on work and personal objectives."

Meadors, a 17-year TECO veteran, says that allowing workers to pursue a combination of training courses makes a compelling case for staying put.

Like many career-minded IT professionals, Meadors says he wants to strengthen "hard" technology skills, like programming techniques. He says he also wants to develop soft skills, like management techniques or knowledge of business functions.

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100 BEST PLACES TO WORK IN IT

In This Series

THIS ISSUE

Overview: "The New Successful Workforce," by Lee Copeland. The best IT employers know that the key to finding and keeping talented workers is to listen to their ideas, invest in their careers and be flexible with their jobs.

Survey Rankings: "The 100 Best Places to Work in IT." Full ranking and information on the offerings of the top IT employers, with an explanation of the methodology used to conduct *Computerworld's* annual survey.

JUNE 12 ISSUE

Retention: "To Have and to Hold," by Kim S. Nash. From customized jobs to flexible work policies to unlimited earnings potential, Best Places to Work are finding new ways to make themselves too attractive to leave. Plus: The 10 Best Places for Retention.

Training: "Keeping Your Staff Marketable," by Erik Sherrman. More than anything, IT professionals value training. The Best Places to Work are willing to take the risk of keeping their staff current on hot skills. Plus: The 10 Best Places for Training.

JUNE 19 ISSUE

Compensation: "Benefit Bonanzas, and Then Some," by Matt Hamblen. When it comes to basic perks, IT workers want them all, plus a fat paycheck. The Best Places to Work use that as a starting point and throw in unique and fun offerings. Plus: The 10 Best Places for Benefits.

Diversity: "Indulging Our Differences," by Kathleen Meiyumka. Whether successful diversity is the goal or merely a by-product of a great work environment, the action plan is the same — recognize each employee as a vital asset with unique needs. Plus: The 10 Best Places for Diversity.

JUNE 26 ISSUE

Career Development: "Lands of Opportunity," by Joanie Wexler. Top companies say investments in career development yield big dividends for employer and employee alike. Plus: The 10 Best Places for Career Development.

Hot Projects: "Taking Techies to Their Limits," by Christine Willard. Technologists love technology, so Best Places to Work make sure their staffs have access to hot projects, key skills and critical development work. Plus: The 10 Best Places for Hot Projects.



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THE NEW SUCCESSFUL WORKFORCE

Continued from page 64

"It's more than money that makes a place a good place to work," Meadors says. "[TECO] wants someone with broader business experience, not just someone who can write good Cobol or C++ code. A lot of projects require good code writing, but they also require good cost justification, a well-written proposal and some understanding of the business process."

In the past year, and on the company's dime, Meadors finished a course in the Internet programming language HTML. He also takes yoga classes during his lunch hour to reduce stress, he says. In September, he plans to take a programming course on sales and automation prior to starting a project along those lines for TECO.

Consensus Building

Angie Brown, a systems engineer for the past two years at home improvement retailer The Home Depot Inc. in Atlanta, says that in addition to training, assignment choice plays a key role in her job satisfaction. Brown says managers "influence but do not control people" and seek input from employees while developing IT projects.

"We have a lot of bright people, and if they can be engaged in our issues and challenges, we can come up with better solutions," says Ron Griffin, CIO at The Home Depot. "We try to involve our [employees] in all aspects of the biz, and not just treat them as technonerd."

Griffin says that by involving the members of his staff in the decision process, they get more involved in finding the best solution. The growing retail chain, which has more than 950 stores, boasts a dramatically low 3.5% turnover rate. Griffin says that's due to the \$9,000 spent annually on training per employee, and on the consensus-building style that he cultivates from the top down in IT.

Technology managers at Allstate Corp. in Northbrook, Ill., also give IT employees a say in determining which projects they will take on next.

Through an internal "All-of-us-at-Allstate" intranet site, staff members can apply for new assignments as they become available. Each posting includes the duration, scope and skills required for the project. A manager then determines if that employee

has the right skills for the project.

"We encourage our employees to take ownership of their own careers and take a proactive role in determining what they want to do," says Mike Escobar, assistant vice president of enterprise and shared services systems and a 25-year Allstate veteran. "People looking for stability might go to corporate systems, financial and the HR systems area... but others can move on every few months to something else."

In addition to letting employees choose work assignments, it's important to offer a full range of assignments as well. Escobar says the company's status as a traditional \$27 billion brick-and-mortar insurance company cum dot-com helps lure Internet-savvy new talent and keep the incumbents on-board.

Last year, Allstate launched a wide-ranging initiative to sell its policies through traditional agents, as well as via direct call centers and over the Web. Officials say the company's IT



We encourage our employees to take ownership of their own careers and take a proactive role in determining what they want to do.

**MIKE ESCOBAR,
ASSISTANT VICE PRESIDENT
OF ENTERPRISE AND SHARED SERVICES
SYSTEMS, ALLSTATE CORP.**

project mix — from back-end legacy system maintenance to e-commerce development — offers a smorgasbord of opportunities to keep a diverse range of staff appetites satiated.

"There is an upper-level commitment to technology," says Escobar. Allstate.com is "our biggest-priority, No. 1 project with a No. 1 focus. It's an allure for people looking at what kind of projects they will do and who want to know that we're working on the newest technology."

Seeking Balance

Accommodating the needs of an employee's family life also creates more job satisfaction, say IT professionals. And it requires flexibility from management.

After five years at United Stationers Inc., Debbie Buchholz was ready for a

change. Buchholz worked as a computer programmer and systems analyst at the Des Plaines, Ill.-based wholesaler of office supplies and equipment. Yet she wanted to start a family and spend less time in the office.

Like the heads of more and more IT departments, United Stationers CIO Ergin Uskup worked out a compromise with Buchholz to keep her on staff: work three days at home and two days in the office.

"We don't have dozens of people working from home in Illinois, but we're not running a sweatshop either," Uskup says. "But we try to accommodate our staff, and we tend to tailor hours to the individual's needs. Most people don't go home at 5 o'clock, but we try to keep a balance and figure out ways to make it work. We realize people have lives."

The Home Depot's Griffin echoes those sentiments. "We say: Be there for the significant life experiences of your family. Balance your work schedule and deal with family issues as you need to," he says.

While Griffin doesn't allow his staff to telecommute, he staggers start times and tries to accommodate family events. For example, he might allow an employee to leave the office early to attend a child's play.

The Home Depot also works with Habitat for Humanity, which builds houses for low-income families. The Home Depot's IT shop has built a house for the nonprofit organization in each of the past nine years. The construction used to take eight weeks to complete. To make it easier for IT volunteers to participate, Griffin now schedules the annual house building during the workweek. "Many of them are already working 60 hours per week, and I'd hate for them to take more time away from their families," he says. "I want people to have balanced lives, and it's a great opportunity to work out of the regular setting with their team and other teams."

In Buchholz's case, flexible scheduling involved more than just philanthropy. It kept her on staff at United Stationers.

"Otherwise, I would not have stayed," acknowledges Buchholz, now an MIS project manager at United Stationers and a mother of two. After managing a yearlong mainframe migration project, she received the promotion from programmer four years ago.

"I had to earn that," Buchholz says proudly. "I still had to prove that I could manage a project and a team and still work from home. It's been really nice to have this flextime, because I don't think I could work five days in the office. My kids have not been in day care; they're with me, and that's important to me." ■

100 BEST PLACES TO WORK IN IT



From the Editor

Of all the special projects we work on each year at *Computerworld*, the Best Places to Work in IT feature continues to draw the widest interest. Calls come into our editorial offices all year long asking when our next survey will be conducted and how companies can get nominated as one of the Best Places.

And no wonder. Recruiting and retention have become the most important — and time-consuming — issues that IT managers face.

In this issue, and continuing in the June 12, 19 and 26 issues of *Computerworld*, you will read about the 100 companies that excel at finding and keeping IT talent. They are true "employers of choice" — boasting low turnover and high staff loyalty.

As the stories of these companies illustrate, there is no secret to retaining IT workers. They have found the keys to be simple:

- Treat workers with respect.
- Listen to ideas.
- Be flexible with workers' job responsibilities, hours and working conditions.
- Provide them with training and education to stay current in the field.
- Give them access to interesting work and technologies.
- Allow workers to take charge of their own careers.
- Make the office a fun place.

As you will see from the companies profiled in this series, when a company can meet these terms, it simply becomes too attractive to leave.

David Weldon

David Weldon
Senior editor/Careers
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100 BEST PLACES TO WORK IN IT

Methodology

Computerworld's 7th Annual 100 Best Places to Work in IT Study

FOR THE SEVENTH YEAR IN A ROW, *Computerworld* conducted its annual survey to identify the 100 best places to work for IT professionals. From Jan. 21 through March 8, *Computerworld* invited CIOs, vice presidents and IT directors at U.S.-based companies that had revenue of \$500 million or

more last year and a minimum IT staff of 15 employees to participate in the survey. Respondents submitted information about their IT organizations online at www.computerworld.com.

Computerworld's 46-question online survey asked about the organizations' benefits, training and development, average

Rank	Company name	Primary business	IT headquarters location	Web address	IT turnover
1	The Home Depot Inc.	Retail	Atlanta	www.homedepot.com	3%
2	Cabot Corp.	Specialty chemicals manufacturing	Boston	www.cabot-corp.com	10%
3	Federal Express Corp.	Business services	Collierville, Tenn.	www.fedex.com	7%
4	Harrah's Entertainment Inc.	Entertainment	Memphis	www.harrahs.com	8%
5	Texas Instruments Inc.	Manufacturing	Dallas	www.ti.com	3%
6	United Stationers Inc.	Retail	Des Plaines, Ill.	www.unitedstationers.com	5%
7	Fifth Third Bancorp	Banking	Cincinnati	www.53.com	8%
8	Avon Products Inc.	Retail	Rye, N.Y.	www.avon.com	8%
9	PricewaterhouseCoopers	Professional services/consulting	New York	www.pwcglobal.com	18%
10	State Street Corp.	Banking	Quincy, Mass.	www.statestreet.com	10%
11	The MONY Group Inc.	Insurance	New York	www.mony.com	8%
12	Charles Schwab Co.	Financial services	San Francisco	www.schwab.com	10%
13	The Reader's Digest Association Inc.	Publishing	Pleasantville, N.Y.	www.readersdigest.com	16%
14	State Farm Insurance	Insurance	Bloomington, Ill.	www.statefarm.com	4%
15	TECO Energy Inc.	Energy/utilities	Tampa, Fla.	www.tecoenergy.com	6%
16	Allstate Insurance Co.	Insurance	Northbrook, Ill.	www.allstate.com	6%
17	GATX Rail	Transportation	Chicago	www.gatxrail.com	9%
18	Lockheed Martin Corp.	Defense/aerospace	Philadelphia	www.lmco.com	17%
19	CDW Computer Centers Inc.	Computer dealer/reseller	Vernon Hills, Ill.	www.cdw.com	9%
20	FleetBoston Financial Corp.	Financial services	Boston	www.fleetbankbostonmerger.com	10%
21	Litton PRC	Information technology	McLean, Va.	www.prc.com	10%
22	Nationwide Insurance Cos.	Insurance	Columbus, Ohio	www.nationwide.com	8%
23	Capital One Financial Corp.	Financial services	Falls Church, Va.	www.capitalone.com	4%
24	Harley-Davidson Inc.	Automotive and transportation equipment	Milwaukee	www.harley-davidson.com	6%
25	Harleysville Group Inc.	Insurance	Harleysville, Pa.	www.harleysvillegroup.com	5%
26	Minnesota Life Insurance Co.	Insurance	St. Paul, Minn.	www.minnesotamutual.com	9%
27	Staples Inc.	Retail	Framingham, Mass.	www.staples.com	12%
28	The Tandy Corp.	Retail	Fort Worth, Texas	www.tandy.com	14%
29	Arrow Electronics Inc.	Retail	Melville, N.Y.	www.arrow.com	8%
30	Autodesk Inc.	Computer services, software	San Rafael, Calif.	www.autodesk.com	12%
31	Royal Caribbean Cruises Ltd.	Travel and entertainment	Miami	www.rccl.com	17%
32	Cisco Systems Inc.	Computer manufacturing	San Jose	www.cisco.com	7%
33	Computer Associates International Inc.	Computer services	Islandia, N.Y.	www.ca.com	8%
34	Lands' End Inc.	Retail	Dodgeville, Wis.	www.landsend.com	5%
35	AFLAC Inc.	Insurance	Columbus, Ga.	www.aflac.com	12%
36	Analog Devices Inc.	Electronics and technology manufacturing	Norwood, Mass.	www.analog.com	14%
37	Corning Inc.	Telecommunications	Corning, N.Y.	www.corning.com	3%
38	NCR Corp.	Computer manufacturing	Dayton, Ohio	www.ncr.com	8%
39	Sears, Roebuck and Co.	Retail	Hoffman Estates, Ill.	www.sears.com	11%
40	The Prudential Insurance Company of America	Insurance	Roseland, N.J.	www.prudential.com	9%
41	Home Shopping Network Inc.	Retail	St. Petersburg, Fla.	www.hsn.com	15%
42	Fannie Mae	Financial services	Washington	www.fanniemae.com	12%
43	Florida Power & Light Co.	Energy/utilities	Juno Beach, Fla.	www.fplgroup.com	6%
44	Intel Corp.	Computer manufacturing	Santa Clara, Calif.	www.intel.com	6%



salary increases, percentage of staff promoted, turnover rates and the percentage of women and minority employees in IT management positions. In addition, information was collected on each organization's hot projects, mentoring programs and a variety of benefits, ranging from elder care and child care to flextime and stock options.

The final ranking was based on the results of the 46-question survey and wasn't limited to the data presented below. All quantitative data was scored separately and given equal weight in determining the final ranking. Rankings were based on the status of and information from the companies at that time. ▀

% of staff employed five years or more	% of IT staff promoted	% of staff in cross-functional teams	% of female IT managers	% of minority IT managers	Average days of training	Average cost of training
98%	26%-30%	100%	36%-40%	11%-15%	17	\$9,000
80%	11%-15%	80%	21%-25%	16%-20%	10	\$8,000
64%	26%-30%	90%	31%-35%	21%-25%	10	\$3,000
60%	26%-30%	85%	41%-45%	11%-15%	14	\$6,000
85%	21%-25%	60%	21%-25%	Less than 5%	10	\$3,000
100%	16%-20%	60%	16%-20%	6%-10%	8	\$3,500
60%	11%-15%	70%	21%-25%	6%-10%	45	\$7,875
44%	21%-25%	70%	26%-30%	21%-25%	12	\$10,000
15%	31%-35%	100%	11%-15%	6%-10%	19	\$7,500
52%	26%-30%	85%	31%-35%	6%-10%	14	\$5,000
60%	21%-25%	100%	41%-45%	11%-15%	9	\$2,000
31%	16%-20%	57%	31%-35%	21%-25%	10	\$5,000
56%	31%-35%	80%	46%-50%	31%-35%	4	\$2,500
71%	21%-25%	80%	31%-35%	6%-10%	8	\$4,400
71%	16%-20%	65%	46%-50%	21%-25%	11	\$2,500
59%	11%-15%	50%	36%-40%	21%-25%	13	\$3,200
46%	11%-15%	70%	46%-50%	6%-10%	10	\$4,000
60%	21%-25%	100%	16%-20%	11%-15%	4	\$2,050
30%	21%-25%	90%	21%-25%	Less than 5%	18	\$20,000
62%	21%-25%	70%	36%-40%	Less than 5%	7	\$9,200
80%	21%-25%	60%	51%-55%	6%-10%	4	\$2,200
52%	16%-20%	90%	41%-45%	16%-20%	10	\$1,970
11%	31%-35%	85%	21%-25%	11%-15%	20	\$6,500
34%	16%-20%	80%	26%-30%	6%-10%	20	\$4,000
85%	Less than 5%	40%	36%-40%	Less than 5%	8	\$2,500
50%	31%-35%	70%	51%-55%	Less than 5%	18	\$2,368
20%	26%-30%	80%	31%-35%	6%-10%	10	\$3,000
45%	21%-25%	30%	31%-35%	11%-15%	5	\$1,540
23%	11%-15%	85%	61%-65%	6%-10%	6	\$5,000
20%	6%-10%	80%	31%-35%	26%-30%	10	\$2,000
40%	11%-15%	75%	31%-35%	51%-55%	5	\$2,400
7%	31%-35%	80%	16%-20%	26%-30%	10	\$10,000
33%	11%-15%	30%	16%-20%	21%-25%	21	\$24,000
51%	26%-30%	80%	21%-25%	Less than 5%	10	\$3,500
46%	26%-30%	50%	26%-30%	16%-20%	5	\$1,100
55%	16%-20%	70%	21%-25%	6%-10%	5	\$5,000
54%	16%-20%	60%	26%-30%	11%-15%	10	\$6,000
64%	11%-15%	50%	21%-25%	6%-10%	9	\$4,500
40%	26%-30%	40%	41%-45%	16%-20%	10	\$1,600
63%	11%-15%	76%	36%-40%	11%-15%	8	\$3,800
50%	16%-20%	70%	31%-35%	Less than 5%	5	\$4,500
42%	11%-15%	59%	41%-45%	26%-30%	11	\$2,700
59%	21%-25%	52%	31%-35%	31%-35%	7	\$3,750
32%	21%-25%	75%	26%-30%	16%-20%	4	\$1,096

Continued from page 69

Rank	Company name	Primary business	IT headquarters location	Web address	IT turnover
45	International Truck and Engine Corp.	Automotive and transportation equipment	Oakbrook Terrace, Ill.	www.navistar.com	3%
46	Silicon Graphics Inc.	Computer manufacturing	Mountain View, Calif.	www.sgi.com	13%
47	Sprint Corp.	Telecommunications	Overland Park, Kan.	www.sprint.com	7%
48	The Earthgrains Co.	Food industry	St. Louis	www.earthgrains.com	1%
49	Avnet Inc.	Electronics and technology manufacturing	Chandler, Ariz.	www.avnet.com	7%
50	UNICOR	Electronics and technology manufacturing	Washington	www.unicor.gov	1%
51	Hewlett-Packard Co.	Computer manufacturing	Palo Alto, Calif.	www.hp.com	15%
52	Household International Inc.	Financial services	Prospect Heights, Ill.	www.household.com	11%
53	Merck & Co.	Pharmaceuticals	Whitehouse Station, N.J.	www.merck.com	5%
54	SAS Institute Inc.	Business services	Cary, N.C.	www.sas.com	3%
55	American Management Systems Inc.	Professional services/consulting	Fairfax, Va.	www.amsinc.com	19%
56	Freddie Mac	Financial services	McLean, Va.	www.freddiemac.com	12%
57	Best Buy Co.	Retail	Eden Prairie, Minn.	www.bestbuy.com	7%
58	Cigna Corp.	Insurance	Philadelphia	www.cigna.com	7%
59	Comerica Inc.	Financial services	Auburn Hills, Mich.	www.comerica.com	6%
60	J. B. Hunt Transport Services Inc.	Business services	Lowell, Ark.	www.jbhunt.com	11%
61	Merrill Lynch & Co.	Financial services	New York	www.ml.com	13%
62	Metropolitan Life Insurance Co.	Insurance	New York	www.metlife.com	13%
63	Tosco Corp.	Energy/utilities	Phoenix	www.tosco.com	4%
64	General Mills Inc.	Food industry	Minneapolis	www.generalmills.com	4%
65	Hewitt Associates LLC	Professional services/consulting	Lincolnshire, Ill.	www.hewitt.com	9%
66	J. C. Penney Co.	Retail	Dallas	www.jcpenney.com	6%
67	Equifax Inc.	Business services	Atlanta	www.equifax.com	15%
68	Mellon Financial Corp.	Financial services	Pittsburgh	www.mellon.com	12%
69	Electronic Data Systems Corp.	IT services provider	Plano, Texas	www.eds.com	17%
70	Georgia-Pacific Corp.	Manufacturing (process)	Atlanta	www.gp.com	7%
71	UnitedHealth Group Corp.	Health/medical services	Minnetonka, Minn.	www.unitedhealthgroup.com	14%
72	Wisconsin Energy Corp.	Energy/utilities	Milwaukee	www.wisenergy.com	7%
73	John Hancock Financial Services Inc.	Insurance	Boston	www.jhancock.com	10%
74	KPMG Consulting LLC	Professional services/consulting	McLean, Va.	www.kpmgconsulting.com	21%
75	Sonoco Products Co.	Manufacturing (discrete; noncomputer industry)	Hartsville, S.C.	www.sonoco.com	11%
76	DPR Construction Inc.	Construction	Redwood City, Calif.	www.dprinc.com	10%
77	Hadco Corp.	Electronics and technology manufacturing	Salem, N.H.	www.hadco.com	10%
78	Roadway Express Inc.	Business services	Akron, Ohio	www.roadway.com	5%
79	Wal-Mart Stores Inc.	Retail	Bentonville, Ark.	www.wal-mart.com	6%
80	Acxiom Corp.	Business services	Little Rock, Ark.	www.acxiom.com	14%
81	The Cincinnati Insurance Cos.	Financial services	Fairfield, Ohio	www.cinfin.com	8%
82	The Principal Financial Group	Financial services	Des Moines, Iowa	www.principal.com	8%
83	Towers Perrin	Business services	Philadelphia	www.towers.com	5%
84	Battelle Memorial Institute	Research services	Columbus, Ohio	www.battelle.org	7%
85	Brinker International Inc.	Food industry	Dallas	www.brinker.com	14%
86	Edison International	Energy/utilities	Rosemead, Ca.	www.edison.com	6%
87	Scientific-Atlanta Inc.	Telecommunications	Norcross, Ga.	www.sciatl.com	11%
88	Bose Corp.	Consumer products	Framingham, Mass.	www.bose.com	16%
89	Burlington Coat Factory Warehouse Corp.	Retail	Burlington, N.J.	www.coat.com	7%
90	Columbia Information Systems Inc.	Health/medical services	Nashville	www.columbia-hca.com	17%
91	Sigma-Aldrich Corp.	Specialty chemicals manufacturing	St. Louis	www.sigma-aldrich.com	8%
92	Ace Hardware Corp.	Retail	Oak Brook, Ill.	www.acehardware.com	1%
93	Deere & Co.	Equipment manufacturing	Moline, Ill.	www.deere.com	4%
94	PG&E Corp.	Energy/utilities	San Francisco	www.pgecorp.com	10%
95	Genuity Inc.	Telecommunications	Burlington, Mass.	www.genuity.com	20%
96	T. Rowe Price Associates Inc.	Financial services	Baltimore	www.troweprice.com	12%
97	American Family Insurance Group	Insurance	Madison, Wis.	www.amfam.com	6%
98	BellSouth Corp.	Telecommunications	Atlanta	www.bellsouth.com	11%
99	Unisys Corp.	Computer services	Blue Bell, Pa.	www.unisys.com	5%
100	W. L. Gore & Associates Inc.	Textile manufacturing	Newark, Del.	www.wlgore.com	14%

Notes. Chart information provided by Computerworld research staff.

% of staff employed five years or more	% of IT staff promoted	% of staff in cross-functional teams	% of female IT managers	% of minority IT managers	Average days of training	Average cost of training
78%	21%-25%	55%	11%-15%	Less than 5%	6	\$6,000
45%	16%-20%	100%	16%-20%	31%-35%	10	\$4,000
35%	26%-30%	35%	21%-25%	16%-20%	10	\$5,000
90%	26%-30%	100%	21%-25%	6%-10%	10	\$5,000
40%	11%-15%	90%	11%-15%	11%-15%	12	\$5,000
71%	6%-10%	80%	36%-40%	6%-10%	8	\$2,500
80%	6%-10%	40%	31%-35%	21%-25%	8	\$6,000
56%	21%-25%	70%	36%-40%	11%-15%	12	\$1,400
50%	11%-15%	60%	26%-30%	6%-10%	3	\$2,000
50%	26%-30%	40%	31%-35%	6%-10%	6	\$2,000
34%	26%-30%	20%	36%-40%	16%-20%	10	\$5,100
52%	21%-25%	47%	41%-45%	11%-15%	7	\$1,549
17%	11%-15%	80%	26%-30%	Less than 5%	10	\$3,000
63%	26%-30%	50%	26%-30%	6%-10%	8	\$4,500
70%	16%-20%	70%	11%-15%	Less than 5%	4	\$1,300
40%	21%-25%	15%	31%-35%	Less than 5%	12	\$4,545
40%	6%-10%	60%	21%-25%	21%-25%	6	\$1,437
52%	6%-10%	65%	31%-35%	11%-15%	12	\$2,500
40%	16%-20%	50%	26%-30%	11%-15%	10	\$6,000
60%	31%-35%	60%	36%-40%	Less than 5%	7	\$2,600
35%	26%-30%	60%	31%-35%	Less than 5%	6	\$3,000
67%	21%-25%	35%	26%-30%	16%-20%	4	\$1,350
35%	16%-20%	50%	41%-45%	16%-20%	5	\$2,000
53%	16%-20%	40%	31%-35%	6%-10%	8	\$1,550
50%	NA	10%	26%-30%	11%-15%	10	\$3,150
45%	21%-25%	20%	31%-35%	16%-20%	10	\$600
44%	11%-15%	75%	31%-35%	Less than 5%	5	\$750
60%	Less than 5%	60%	26%-30%	6%-10%	8	\$3,245
44%	16%-20%	40%	36%-40%	6%-10%	6	\$1,700
23%	11%-15%	40%	26%-30%	11%-15%	4	\$3,000
55%	16%-20%	90%	6%-10%	Less than 5%	12	\$3,800
10%	6%-10%	33%	Less than 5%	Less than 5%	10	\$2,000
60%	21%-25%	75%	21%-25%	6%-10%	7	\$5,000
58%	16%-20%	95%	11%-15%	Less than 5%	3	\$1,260
44%	21%-25%	50%	Less than 5%	Less than 5%	25	\$4,500
40%	21%-25%	100%	11%-15%	Less than 5%	4	\$4,500
56%	16%-20%	51%	31%-35%	6%-10%	18	\$3,000
59%	Less than 5%	86%	41%-45%	Less than 5%	10	\$4,000
20%	11%-15%	80%	21%-25%	11%-15%	10	\$5,000
60%	16%-20%	50%	11%-15%	6%-10%	5	\$2,000
48%	11%-15%	40%	26%-30%	Less than 5%	5	\$2,000
42%	6%-10%	30%	21%-25%	26%-30%	5	\$1,200
56%	11%-15%	55%	26%-30%	21%-25%	10	\$2,008
25%	16%-20%	75%	36%-40%	Less than 5%	10	\$2,500
52%	6%-10%	80%	16%-20%	6%-10%	8	\$3,500
34%	11%-15%	51%	36%-40%	6%-10%	5	\$1,550
40%	6%-10%	80%	21%-25%	Less than 5%	10	\$2,000
37%	16%-20%	45%	21%-25%	Less than 5%	8	\$1,445
70%	11%-15%	20%	16%-20%	Less than 5%	15	\$7,100
70%	6%-10%	10%	21%-25%	21%-25%	14	\$1,000
30%	31%-35%	40%	16%-20%	6%-10%	10	\$6,000
27%	6%-10%	63%	21%-25%	Less than 5%	4	\$2,452
48%	11%-15%	70%	46%-50%	Less than 5%	6	\$3,778
70%	6%-10%	70%	26%-30%	11%-15%	4	\$1,150
60%	6%-10%	50%	11%-15%	6%-10%	10	\$1,500
50%	46%-50%	70%	Less than 5%	Less than 5%	5	\$3,000

UCITA

BY JAIKUMAR VIJAYAN

THE UNIFORM Computer Information Transactions Act (UCITA) is a draft law that seeks to bring consistent rules to software contracts and licensing agreements.

It was created and adopted by the National Conference of Commissioners on Uniform State Laws and was sent last July to the legislatures of all U.S. states and territories for consideration. But UCITA has been plagued by controversy almost since work began on drafting it back in 1996.

Opponents — and there are many — say UCITA is too broad and gives far too much power to software vendors.

"The simple case is that it is a bad thing for consumers of any type, whether you are an individual or a business," says Randy Roth, director of corporate purchasing at Principal Financial Group in Des Moines, Iowa.

"The only organizations it is good for are the software vendors," Roth adds. "Don't call it UCITA, just call it the Licenser Protection Act."

Skip Lockwood, director of Washington-based For a Competitive Information and Technology Economy (www.4cite.org), a coalition of end users and trade associations opposed to UCITA, agrees.

"UCITA is anticompetitive and is counter to the whole economic model we have been currently using," he says.

'Rules of the Road'

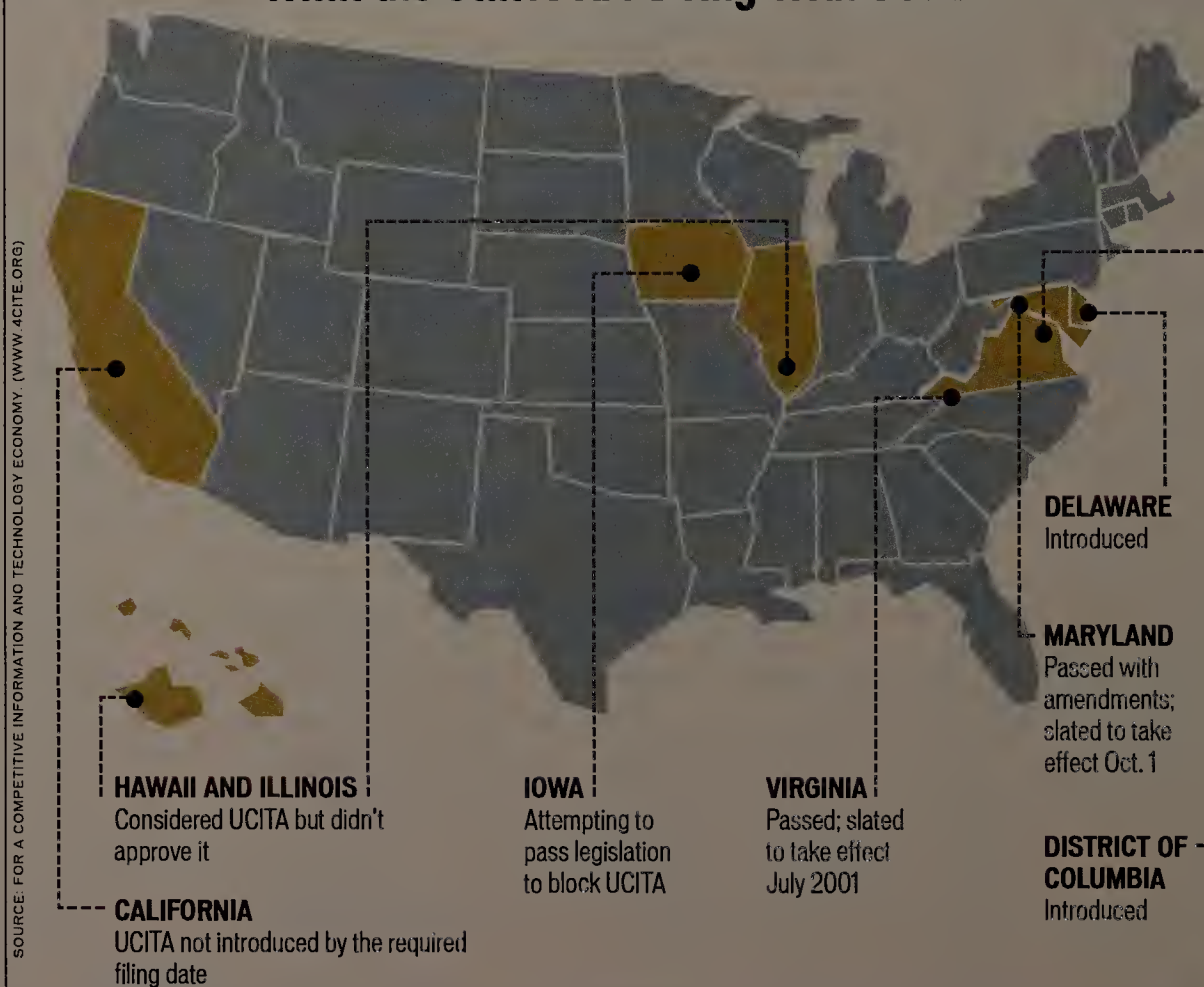
UCITA was born out of a need to have common, legally enforceable rules governing software contracts at a time when the Internet is rapidly changing the way people buy and use software, explains UCITA proponent Keith Kupferschmid, intellectual property counsel for the Software & Information Industry Association (SIIA) in Washington.

"UCITA sets out the rules of the road for licensing of software products, especially in the

DEFINITION

The **Uniform Computer Information Transactions Act (UCITA)** is a draft law aimed at creating consistent rules for software licensing and contracts.

What the States Are Doing With UCITA



online environment," he says.

UCITA is very similar to the Uniform Commercial Code, which covers physical products and goods. It establishes the legal rights of software buyers and sellers. It covers standard and custom-developed software licenses and those that deal with online access of software. It addresses issues such as shrink-wrapped and online click-through licenses, warranties, transfer of ownership rights, contract terms, disputes and vendor liability for defects.

Current laws are inadequate and open to varied interpreta-

tions in different states, says Kupferschmid.

Also, currently there aren't uniform contract laws that apply to custom-developed software, he says. Such issues are becoming more important as people use the Internet to cut across state lines when buying software, Kupferschmid adds.

"The only uniform rules out there apply to tangible goods — not the software on a CD-ROM, but on the CD-ROM itself," Kupferschmid says.

One of the principal concerns among opponents of UCITA is that it automatically validates all the terms and con-

ditions in shrink-wrapped licenses, click-through agreements and default clauses without giving users much course for legal redress, Lockwood says.

"Under UCITA, those terms are just enforceable, period. It's the law," he says.

For instance, UCITA allows software companies to avoid liability for damage caused by defective software, even though the problems were undisclosed to the customer at the time of purchase.

Another major concern is a provision that says users who don't uphold software licens-

ing agreements could have their software shut down remotely by the manufacturer.

Other issues include provisions prohibiting the transfer of software between companies, even in mergers and acquisitions, and other rules that tie buyers to agreements that were disclosed only after purchase.

The ability of each state to amend UCITA, and the fact that not all of them may eventually enact it, also weakens its potential of becoming a widely accepted law, critics claim.

Supporters such as the SIIA dismiss such concerns and claim that customers remain free to negotiate their own terms with vendors. Important provisions — such as a 15-day notice period before a vendor can disable software, for instance — ensure consumer protection, say SIIA officials.

Cautiously Moving Ahead

But the controversy has caused states to exercise extreme caution as they move to enact UCITA.

The Virginia Senate was one of the first legislative bodies to approve the act, but enactment has been deferred to July 1, 2001, to accommodate provisions aimed at ensuring consumer protection.

Maryland also approved UCITA, and it appears to be poised to become the first state to enact it this October.

Iowa, meanwhile, is trying to pass "bomb-shelter" legislation that would prevent consumers in the state from the effects of UCITA.

Some states, including Hawaii and Illinois, have considered UCITA and have decided not to move forward with it.

Although the legislation isn't expected to be ratified by every state, it is expected to be introduced in all 50 states and territories during the next year and a half.

Lockwood says that more discussion about UCITA will only increase the ranks of his opposition group, 4cite.org.

"I expect I will be adding more members," he says. ▀

Dear Career Adviser:

I'm a college graduate and a 20-year information technology professional. I'm the CIO at a small company and interested in moving. I am responsible for numerous IT projects with budgets ranging to \$15 million. Is the Web the right way to look for a new senior-level job?

Also, will my total years of experience, age or not being a "hands-on" techie with the latest programming skills work against me? — CONCERNED CIO

Dear Concerned:

The intersection of CIO positions and job advertising on the Web has definitely arrived, affirms Tony Lee, editor in chief and general manager of *The Wall Street Journal Interactive Edition*, whose site (www.careers.wsj.com) includes plenty of CIO job listings, plus upper-level salary information and career resources. And you'll probably want to check out other sites such as CIO.com or even membership sites like Exec-U-Net and Netshare, where candidates pay to access unadvertised positions, most of which have been posted by executive recruiters.

Although many companies don't expect CIOs to be hands-on technical, Neil Fox, CIO and vice president of infor-

mation systems at Management Recruiters International Inc. in Cleveland, says a good CIO should be at least moderately technically oriented.

"Companies are seeking solid business experience plus technical expertise in enterprise resource planning, help desk operations, IT processes and wide-area networking or want their CIO to lead an effort to benchmark best practices against similar-size companies," Fox says. Although a \$15 million budget might sound pretty large, he recommends stating your net budget of telecommunications bills or WAN expenses.

Dear Career Adviser:

I've been a Sybase database administrator for two years and have more than five years of strong database modeling and design experience. I'm concerned that Sybase doesn't offer the career opportunities that I'd have with Oracle. Am I wrong? I have taken classes

and computer-based training, but how do I get hands-on Oracle experience that increases my opportunities?

— UNDAUNTED DBA

Dear Undaunted:

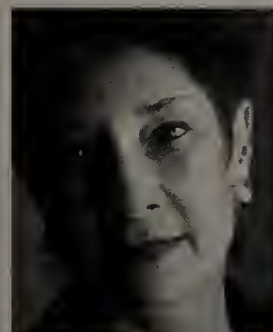
Oracle definitely has a strong market position, and there are a lot of candidates out there with Oracle knowledge, says recruiter Matt Harris at TechLink Systems Inc. in San Francisco. On the other hand, while there are fewer opportunities with Sybase, there are also fewer qualified candidates. So take your pick: a bigger market with more jobs and more competition or a smaller market with fewer openings but also fewer competitors.

To add to your job security in the Sybase world — if you elect to stay with Sybase — Harris advises seeking out Sybase opportunities that are either extensive contracts or permanent jobs and to definitely start taking Oracle

classes. Thorough knowledge of two databases is a definite advantage, he says, and makes a candidate even more attractive to prospective employers.

Dear Career Adviser:

After 15 years, my experience ranges from mainframe programming and Common Information Model management to Internet and networking support. With a master's in library and information science, I work in education, implementing access to electronic resources for 19 different campuses at a large university. I speak five languages, including Japanese, and want to work for a technology company, preferably doing technical consulting in Asia. Given my skill set, will I be able to do this? — WILLING TO TRAVEL



FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_adviser.

Dear Willing:

Your wish might come true, since many foreign-capitalized American companies are hiring aggressively in Asia right now, at a time when many Asians have come to the U.S. for work and exposure to advanced technologies, according to Michael Nishi, president of Asia-Net

(www.asia-net.com). Asia-Net is an online professional community run by Scotts Valley, Calif.-based Tapestry.Net Inc. that focuses on Far East career opportunities. The fact that you speak Japanese also should help but don't think it will be a slam dunk.

Your noncommercial-industry specialization and broad-brush background may make Asian-based employers less likely to hire you

for technical Web consulting or package-specific roles. Employers may find it hard at first to see you as skilled enough to make an immediate contribution or knowledgeable enough in the technical skills that would make you an ideal consultant.

To see how you can make yourself

more marketable internationally — and at home — check your skill set against Nishi's hot-skills list for Asian jobs.

The list includes a knowledge of Web application programming languages such as Perl, HTML, Common Gateway Interface and Java; knowledge of databases such as Oracle and SQL; experience with operating systems such as Unix, Windows NT and Linux; and some network and security experience. ▶

BRIEFS

Network Leaders Form Optical-Systems Firm

Representatives from Cisco Systems Inc., Lucent Technologies Inc., Nortel Networks Corp. and Hewlett-Packard Co. have formed Maple Networks Inc. in San Jose. The new company plans to develop multiservice optical systems that address carriers' costs of managing and providing multiple services over their networks. Raza Foundries Inc. has invested \$9 million in the initial round of financing. Bill Joll, former president of Nortel Networks' European Market Solutions division, was named Maple Networks' CEO.

Internet Service Firms Team Up

Primix Solutions Inc., an Internet services company in Watertown, Mass., has acquired Primant AB, a Swedish Internet services company with 63 employees. Primix said the acquisition will allow it to better serve a growing base of international clients.

Utilities to Develop European Exchange

A group of 12 European utilities companies have agreed to create a business-to-business portal for procurement exchange, announced Italian electricity company Enel SpA last week. The companies will cre-

ate an electronic market for buyers and suppliers in the electricity and water utilities sector, Enel said. The consortium intends to begin online exchanges during the third quarter, making use of online auction mechanisms, according to Enel.

SAS to Launch Online Spin-off

U.S. statistical analysis and data warehousing software vendor SAS Institute Inc. recently announced that it's creating a new a business-to-business Internet operation. IBiomatics LLC will be a wholly owned subsidiary of Cary, N.C.-based SAS. The company will concentrate on biomedical research, SAS said in a statement. The subsidiary will use Internet

portals to allow life sciences researchers to exchange data about the safety and effectiveness of drugs and medical devices.

IBM, Macromedia Bond for E-Biz Apps

IBM and Macromedia Inc. last week announced a multiyear strategic alliance that they hope will help their customers develop and deploy personalized e-commerce applications. IBM will license and distribute Macromedia's LikeMinds Personalization Server as an integrated component of future versions of its WebSphere product line. Macromedia, in turn, will license and distribute a developer's version of IBM's WebSphere Application Server with its Dreamweaver content-authoring

platforms for the Web. The agreement also calls for IBM to bundle trial versions of Macromedia's Flash, Freehand, Director and Fireworks offerings with WebSphere Studio.

DoubleClick Bets On Flatbase

Internet advertising company DoubleClick Inc. in New York announced last week that it has acquired 60% of the stock of Flatbase Inc., also in New York. Flatbase provides automated design and management for conducting online sweepstakes. DoubleClick said it would acquire the remaining shares of Flatbase sometime this month. The two companies didn't disclose financial terms of the deal.

Spine-tingling suspense...

Shoot outs...

Startling revelations...

YES, WE ARE TALKING ABOUT A TRADE SHOW HERE.

PC EXPO

Jacob Javits
Convention Center,
New York City

Exhibits:
June 27-29, 2000

Conference:
June 26-29, 2000

Use source code M2AG
when registering

Doesn't sound like the PC EXPO of last year, does it? Well, it's not. It's a new event that's as **fast** as the pace of today's economy. And if you sit still for too long, you'll be missing out on all the action.

Get started with a **customized** itinerary that moves you toward your solutions at lightning speed. Dive into the future of handheld devices. Submit your RFPs, and be part of a live forum where leading vendors propose their solutions to real problems.

Listen and **learn** as industry leaders shoot-it-out in head-to-head debates. Get going on your SANS GIAC Windows Security Certification. Beef up your networking acumen at Novell's BrainShare On Tour. Check out our new expanded conference program with special sessions for the Channel, small business, and IT executives. It's all coming to PC EXPO this year and in the years to come. And if you're ready for an event that can offer strategies, solutions—and more than a few **surprises**—you'll be coming, too.

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CMP



IT for Business

TECHNOLOGY

LET'S ALL TALK

An evolving breed of Web applications that wrap around streaming video, audio and slides can provide one-to-many conferencing for up to 5,000 concurrent users. **► 76**

NO MORE FRAGMENTATION

Having 30,000 users accessing shared information on servers led to noticeable system performance degradation at Chevron Corp. The problem was disk fragmentation. Learn how Chevron cleaned up its problems. **► 76**

HANDS-ON MANAGEMENT

Tivoli Systems Inc. says companies that use its new Tivoli Device Manager can use the company's framework software to manage handhelds running the Palm operating system. **► 79**

CRUSOE LANDS

Gateway's announcement that it will use the Crusoe chip from Transmeta in Web appliances marks the first use of the low-power processor by a major PC maker. Some IT managers are intrigued, but it's not clear when — or whether — Crusoe will land in corporate systems. **► 80**

BETTER FLATTER

If you can handle the hefty purchase price, an 18-in. LCD flat-panel monitor might be the

nicest thing IT could ever supply you with, according to reviews editor Russell Kay. It's easier on eyes, and it opens up new possibilities for multiple windows and multitasking. **► 82**

QUICKSTUDY

As the demand for — and hype surrounding — handheld wireless Internet access grows, there's disagreement about the best way to put Web pages on phones and PDAs. *Computerworld* presents an introduction to Wireless Application Protocol and Web clipping. **► 84**

FUTURE WATCH

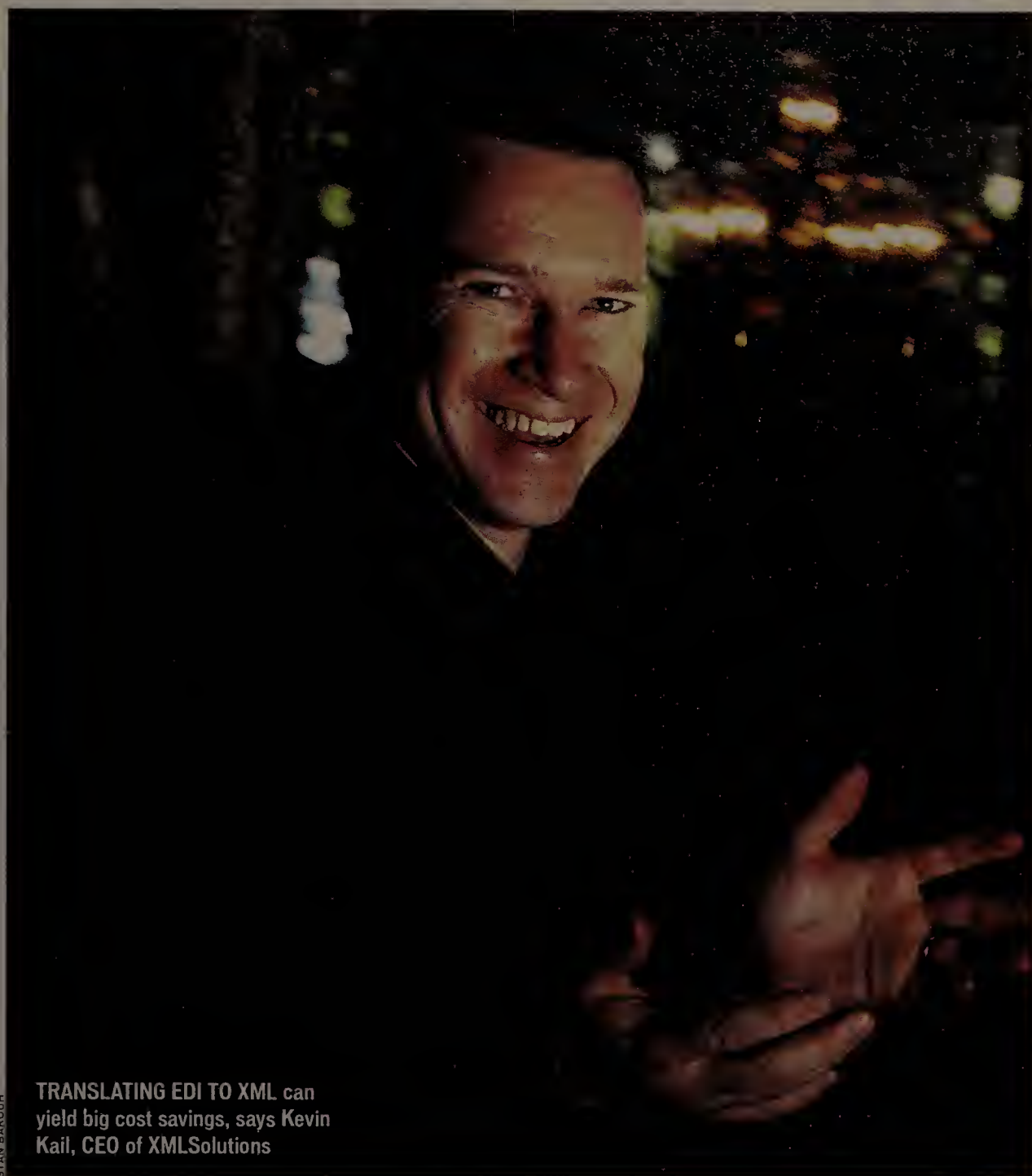
Their roots are in the rarified world of artificial intelligence, but as computing bots and agents become increasingly pervasive, their practical potential is enormous. **► 85**

PACKAGED PORTALS

Building an enterprise portal isn't easy, what with the need to integrate legacy data and customize user interfaces. Some users say it's more cost-effective to buy an off-the-shelf portal package than it is to build the necessary tools themselves. **► 86**

GOING IT ALONE

Dreaming of hanging out your own shingle? Working for yourself can be the most satisfying job in the world. *Computerworld* offers words of wisdom from two people who have done it. **► 92**



TRANSLATING EDI TO XML can yield big cost savings, says Kevin Kail, CEO of XMLSolutions

PROFITABLE CONVERSIONS

FOR THE MANY COMPANIES that must conduct e-commerce by using different flavors of electronic data interchange (EDI), XMLSolutions Corp. promises to simplify conversions to the content-tagging language XML and allow new relationships with companies that can't afford EDI. The up-and-coming company will have to keep those promises to hold its own against well-financed competitors.

88

ADP Takes MShow on the Road With Sales Staff

Web presentation systems make online meetings practical for some

BY JAMES COPE

THIS WEEK, while thousands of businesspeople board airplanes bound for meetings or training sessions, Automatic Data Processing Inc. (ADP) in Roseland, N.J., will begin holding monthly meetings via the Internet for its 350 salespeople who sell services to automotive dealers.

Dan Davis, ADP's manager of sales presentations for North America, uses a system from MShow.com Inc. in Highlands Ranch, Colo., an application service provider (ASP) that automatically formats and broadcasts various types of content via the Internet.

MShow.com can stream content — even motion video — to 5,000 users at a time, but Davis said he limits the broadcasts he prepares to PowerPoint slides,

streaming audio and interactive chat.

Davis said ADP's presentation development staff will create the slides and "blow them into a show" (upload them to MShow's servers) prior to a presentation.

Most attendees dial in via a local Internet service provider. But Davis said MShow.com's technology compensates for slow connections, even those of analog modems, by caching the streaming information to users' local hard drives.

"While users are in a virtual waiting room waiting for the presentation to begin, the content from a recorded presentation is already going onto users' hard drives," Davis said.

MShow.com also automatically detects bandwidth constraints affecting users who are logged on in real time and dynamically configures the con-

Web Presentation Apps

FEATURES	EVIDEO SERVER	MSHOW.COM
Installs on enterprise server	Yes	No
Available as a hosted application (from an ASP)	Yes	Yes
Readies presenter's slides and videos for webcasting	Yes	Yes
Broadcasts audio	Yes	Yes
Offers real-time polling	Yes	Yes
Number of concurrent users supported	1,000	5,000

tent accordingly, said MShow.com President John Rouse. A user whose system is overwhelmed by streaming audio, for example, might be prompted to listen on the telephone instead of through the PC's sound system.

ADP's Web presentations generally use a primary audio presenter and sometimes a sidekick who provides "color the way they do on a radio show," according to Davis.

Rouse said most large enterprise customers pay for the service on a subscription basis, which, on average, runs around 50 cents per minute per user. The company sells services on a per-event basis, too, he said.

Mike Malmquist has needs similar to those of Davis, including a desire to cut travel costs and speed delivery. But the Web analyst at Lutheran Brotherhood, a financial services company in Minneapolis,

is taking a slightly different approach. Malmquist said he's testing the eVideo Application Server (eVAS) introduced two weeks ago by PictureTel Corp. in Andover, Mass.

The eVAS can either run on servers in the enterprise or be hosted by ASPs. It supports up to 1,000 concurrent users.

Initially, Lutheran Brotherhood hopes to use eVAS for online training presentations, Malmquist said. Like Davis, he said he would record presentations for future replay. He also noted that eVAS supports polling by placing buttons into PowerPoint slides where users can click to respond to a poll.

The enterprise server price starts at \$25,000 for 200 concurrent users, according to PictureTel.

Customers that use eVAS through an ASP will pay a one-time fee of \$55 to \$125 per concurrent user, depending on the number of users.

"[PictureTel is] a little late, but they have some advantage with resellers and their experience in video," said Sujata Ramnarayan, an analyst at Gartner Group Inc. in San Jose.

PictureTel said last week that the company would begin offering eVAS as a hosted service through its subsidiary 1414c within the next 30 days. ■

Chevron Cleans Up Fragmented Drives

Symantec's Norton Speed Disk Chosen

BY KATHLEEN OHLSON

Having 30,000 users accessing shared information on its servers led to noticeable system performance degradation at Chevron Corp. about 18 months ago. The problem was disk fragmentation.

The barrage of activity, in which users accessed Microsoft Corp.'s System Management Server, along with application and file servers, created the problem on laptops, desktops and servers, said Mike Wolfe, senior engineer of security at Chevron's information technology arm in San Ramon, Calif.

After monitoring the activity for three months, Chevron found that 33% of the files on

users' PCs and laptops had data stored haphazardly on the hard disks, Wolfe said.

The \$2 billion San Francisco-based petroleum giant's IT staff blamed the problem on the way Microsoft's Windows NT 4.0 Workstation stores data on hard drives. Data wasn't being stored sequentially, but wherever space on the drives existed, Wolfe said. The disk fragmentation problem damaged some files and increased the number of calls to the help desk, he said.

Looking for a fix, Chevron tested Symantec Corp.'s Version 5.0 of Norton Speed Disk for Windows NT and Executive Software International's Diskeeper 5.0, along with several other products Wolfe was unable to name. Wolfe and his team picked Norton Speed Disk 5.0, citing better performance and more efficient

hard-drive optimization, enabling users to manage the defragmentation process themselves, Wolfe said.

A cost-effective licensing and maintenance agreement was also a factor, he said. Symantec's list price is \$49.95 per seat, but Wolfe declined to say how much Chevron paid for its license.

According to Wolfe, Norton Speed Disk has accelerated hard-drive access for end users by an average of 20%, depending on the particular fragmentation level and which applications were typically run.

"Our support people felt like the Maytag [repairman]" as the number of calls for support decreased, Wolfe said.

But not everyone at Chevron is impressed with Norton Speed Disk's performance.

Rick Roller, Chevron's desk-side support senior analyst,

said the fragmentation problem has been reduced, but files still need to be optimized better. He agreed that the way NT stores data on the drives is part of the problem.

Microsoft didn't respond to requests for comment.

The fragmentation issue may be further resolved with the deployment of Windows 2000, which Chevron expects to carry out within six to 12 months, Wolfe said. The company will take another look at the performance and capability of Executive Software's Diskeeper 5.0, which is built into Windows 2000. Chevron may stick with Norton Speed Disk, or it may use both products, he said.

Chevron's problem is a common one, according to International Data Corp. (IDC), a Framingham, Mass.-based research firm. Over time, files can take 10 to 15 times longer to access, boot times may triple and nightly server backups can take hours longer, IDC said. ■

AT A GLANCE

Chevron Picks Symantec Fix

The \$2 billion petroleum giant uses Symantec's Norton Speed Disk for Windows NT.

Why: Chevron ran into major disk defragmentation problems when it implemented Windows NT 4.0 Workstation. Approximately 30,000 desktops and laptops across the enterprise were impacted, causing system slowdowns and corrupted files.

What happened: it looked at five products, including Norton Speed Disk for NT and Executive Software International's Diskeeper. Chevron selected Norton Speed Disk on the basis of cost and performance; the company also had an existing relationship with Symantec, having used its Norton antivirus and PCAnywhere software.

Results: Norton Speed Disk for NT sped up machines by 20%, depending upon how much defragmentation occurred and what applications are run. The defragmentation process takes about 15 minutes to one hour, depending upon how much fragmentation has happened. The software also offers optimization and an information alert when fragmentation reaches a certain level.



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Large Variety of WAP Phones Make Testing Paramount

BY MATT HAMBLIN

The Wireless Application Protocol (WAP) was designed to make it easier to build applications for handheld

phones and other devices, but that doesn't mean building them is easy, developers say.

There are so many kinds of wireless

handheld devices and the network is so complex that testing is even more important with WAP applications than with other kinds, they say.

That's why application development managers at three companies building WAP applications for banking and other uses said they welcome a new testing lab and the online community of AnywhereYouGo.com, which is based in London with U.S. offices in Dallas.

The site boasts 7,500 developers globally who can use free online testing tools and compare notes with one another. On May 10, the site also announced a laboratory in London for developers to test applications on up to 27 WAP phone models. A low-level test of an application could take about a week and costs \$750, while a more sophisticated test could last three weeks and cost \$7,500, AnywhereYouGo.com officials said.

Necessary Tests

"As a WAP developer, you do have to seriously test products across the phones out there. And as the number of phones grows, there will be a huge load on developing companies for running tests," said Damian Bown, CEO at Kizoom Ltd. in London, which is releasing a WAP application to bring wireless users instant access to transportation schedules and fees based on their itinerary and location.

"AnywhereYouGo is really going to help with changes in the phone product," Bown said.

"With WAP, we're very much like the world was in 1994 with the World Wide Web," said Michael Fuchs, webmaster at e-commerce server vendor Netfish Technologies Inc. in Santa Clara, Calif. "There's a balkanization of devices that need access."

Tim Youngblood, research director at Magnet Communications Inc. in Atlanta, said AnywhereYouGo.com is the only destination he has found that puts together testing tools with a communications hub for developers to share information. His company is building wireless banking applications for several large banks and plans to use the laboratory later this year, he said.

All three companies have been testing applications in-house, but they said the WAP world is quickly going to grow too complex for them to keep track of new developments.

Typically, errors in writing WAP applications occur in adapting the application for a particular device. And when an error occurs, it can shut out a user from a site, eliminating the application's efficiency.

AnywhereYouGo.com recently conducted a survey of 50 WAP-enabled Web sites and found 28% of them had errors, company officials said.

Speed is the main reason to do thorough testing, because you need to have speed to bring products to market.

DAMIAN BOWN,
CEO OF KIZOOM



"Speed is the main reason to do thorough testing because you need to have speed to bring products to market," Bown said. "The last thing you want is a user turning on a WAP phone and going to a service and finding it doesn't work."

The new lab validates applications using actual WAP handsets and gateways, integrated with AnywhereYouGo.com's proprietary testing software. Officials said the service will ensure that WAP sites are compliant with industry standards and compatible with unique devices.

For example, a company with a WAP application might find that certain phones don't support bold or italic typeface, which could make a company logo impossible to use. Bown said his company's applications will identify the kind of phone being used and let the application respond to specific functions.

"Even though we test in-house, we know that we're simply not able to keep with the growing number of devices and gateways," Bown said.

"We're in the early stages of WAP, so it's not a bad idea for developers to compare notes and get a stamp of approval" from a company such as AnywhereYouGo.com, said Alan Reiter, an analyst at Wireless Internet and Mobile Computing in Chevy Chase, Md.

WAP is in its infancy in the U.S., analysts said, with much greater deployment in Europe. Framingham, Mass.-based International Data Corp. predicts that by year's end there should be about 99 million WAP-enabled Internet subscribers worldwide. That number is expected to surpass 744 million in 2002 and hit 1.3 billion in 2004. ▀

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Network Management in the Palm of a Manager's Hand

BY SAMI LAIS

Tivoli Systems Inc. says companies that use the new Tivoli Device Manager (TDM) can manage handhelds running the Palm operating system through the company's framework software.

According to Austin, Texas-based Tivoli, TDM allows access by the remote devices to resources such as networked data storage. It also lets systems administrators manage their Palms with the same Tivoli Management Enterprise (TME) Console they use to run other devices.

TDM works by means of a Device Actuator agent, a small piece of code that resides on each Palm handheld. The Device Actuator collects information to feed back to the system when the user synchronizes the Palm. The flow is in two directions: The Device Actuator can execute commands and download data from the TDM server as well as upload data.

More Features

Some of the new product's capabilities have been available individually from various companies. They've also been available from competing framework vendor Computer Associates International Inc. in Islandia, N.Y., through its Unicenter enterprise management software.

But TDM extends the reach of systems administrators further than the competition, adding features such as automatic software distribution and removal, remote configuration, device management via user-profile groups and inventory tracking, according to a spokesperson at Santa Clara, Calif.-based Palm Inc.

Concero, an e-commerce development consultancy, was an early user of TDM. The Austin, Texas-based company can now update employees who work at multiple, changing sites and "use a variety of tools, including PCs and Palm devices," a Concero spokesman said.

"When wireless and pervasive devices are discussed, it's often in the context of individuals," said James Governor, an analyst at Illuminata Inc. in Nashua, N.H., in a recent report. "The real payoffs, however, are in groups. And it's as much about infrastructure as about devices."

VicRoads, a government road-maintenance agency in Victoria, Australia, was a TDM beta user. Each day, road inspectors and work crews use a custom application to enter information on road conditions and work performed into a

Lotus Notes database. Managers use information from both groups to make daily assignments.

When mobile staffers synchronize the Palm units, the Device Actuator initiates replication of their data to Palm and Notes servers and delivers the new assignments.

AT A GLANCE

Tivoli Device Manager

AVAILABLE TODAY:

Palm OS support, including autodiscovery of Palm devices, software distribution and removal, asset tracking, management via user profile groups and event correlation

COMING THIS YEAR:

- Support for Windows CE, Epoc32 (the leading European operating system for handhelds)
- "Pull" software distribution, which will let handheld users choose software to download
- Security features
- Backup and restore functionality
- Wireless connectivity
- Device Manager tools software development kit

TDM was first released in March. New versions due later this year will support Windows CE, let handheld users choose software to download and include Tivoli Device Manager tools for software development.

Coming Soon

Set for release early next year is support for Epoc32, Europe's leading handheld operating system, and security support for distribution and management of enhanced encryption.

Palm last week announced its own management product, HotSync Server synchronization software for Windows

NT servers, which is scheduled for release later this year.

As the number of handheld applications grow, "management is going to

become a big issue," said Paul Mason, an analyst at International Data Corp. in Framingham, Mass. "People are doing real work with them."

Device Manager costs \$31 per device and the price of TME varies according to installation size and complexity. ■

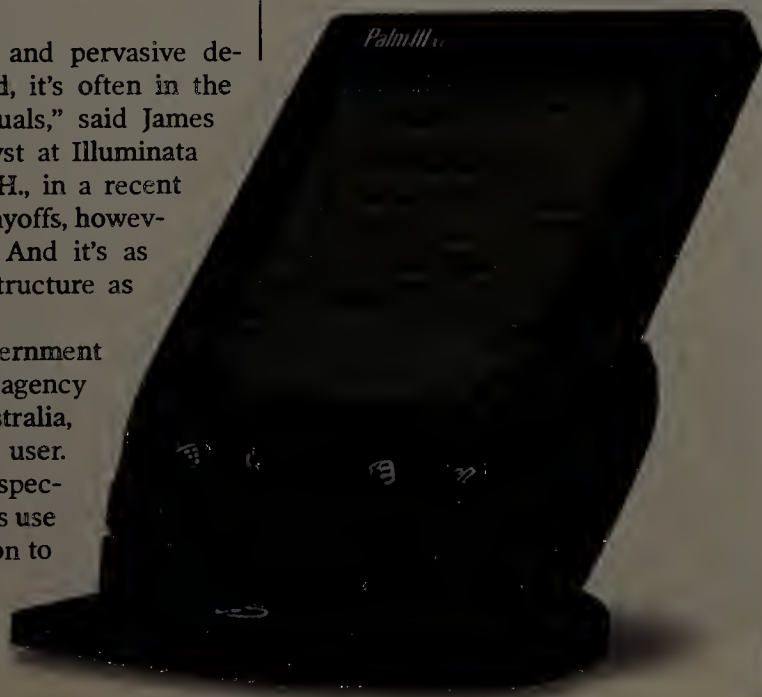
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Crusoe Chip Launches in Web Device; IT Impact Unclear

BY ROBERT MITCHELL

Some IT managers hope the Transmeta Crusoe chip will deliver longer battery life and increased competition to processor giant Intel Corp.

But despite last week's announcement that Gateway Inc. would be the first PC manufacturer to use the chip, information technology managers say it's unclear how much impact that development will have in corporate IT environments.

San Diego, Calif.-based Gateway said it will power its line of wireless Internet appliances with the Crusoe chip and the Mobile Linux operating system, both from Santa Clara, Calif.-based Transmeta Corp. Crusoe is a software-upgradable processor that Transmeta claims consumes less power, takes up less space and runs cooler than comparable processors from Intel or National Semiconductor Inc.

Gateway, which owns a stake in Transmeta, said it chose Crusoe for just those reasons. The company won't comment on its plans for using the chip in notebooks or other devices.

Compaq Computer Corp. and IBM plan to use it in ultralightweight portables later this year, said Rob Enderle, an analyst at Giga Information Group Inc. Neither IBM nor Compaq would comment for this story.

Corporate users are circumspect. Gary Bernstein, senior systems analyst at a global oil company, said he would be interested in devices based on Crusoe because he's always looking for new technology.

"I'd at least give it a try," added Jeff LePage, director of MIS at American Fast Freight Inc., a shipping company in Kent, Wash. "In my opinion, it's best suited for smaller handheld devices, not for the desktop," he said. "But I'd be willing to give it a shot."

Crusoe's battery-life advantage may dissipate, however, as vendors scale up from Internet appliances into notebook computers, said Tom Halfhill, senior editor of "The Microprocessor Report" newsletter in Sunnyvale, Calif. "Even if you're getting one-tenth the power consumption [from Crusoe], you won't get 10 times the battery life," said Halfhill.

Another hot-button issue for IT managers is choice.

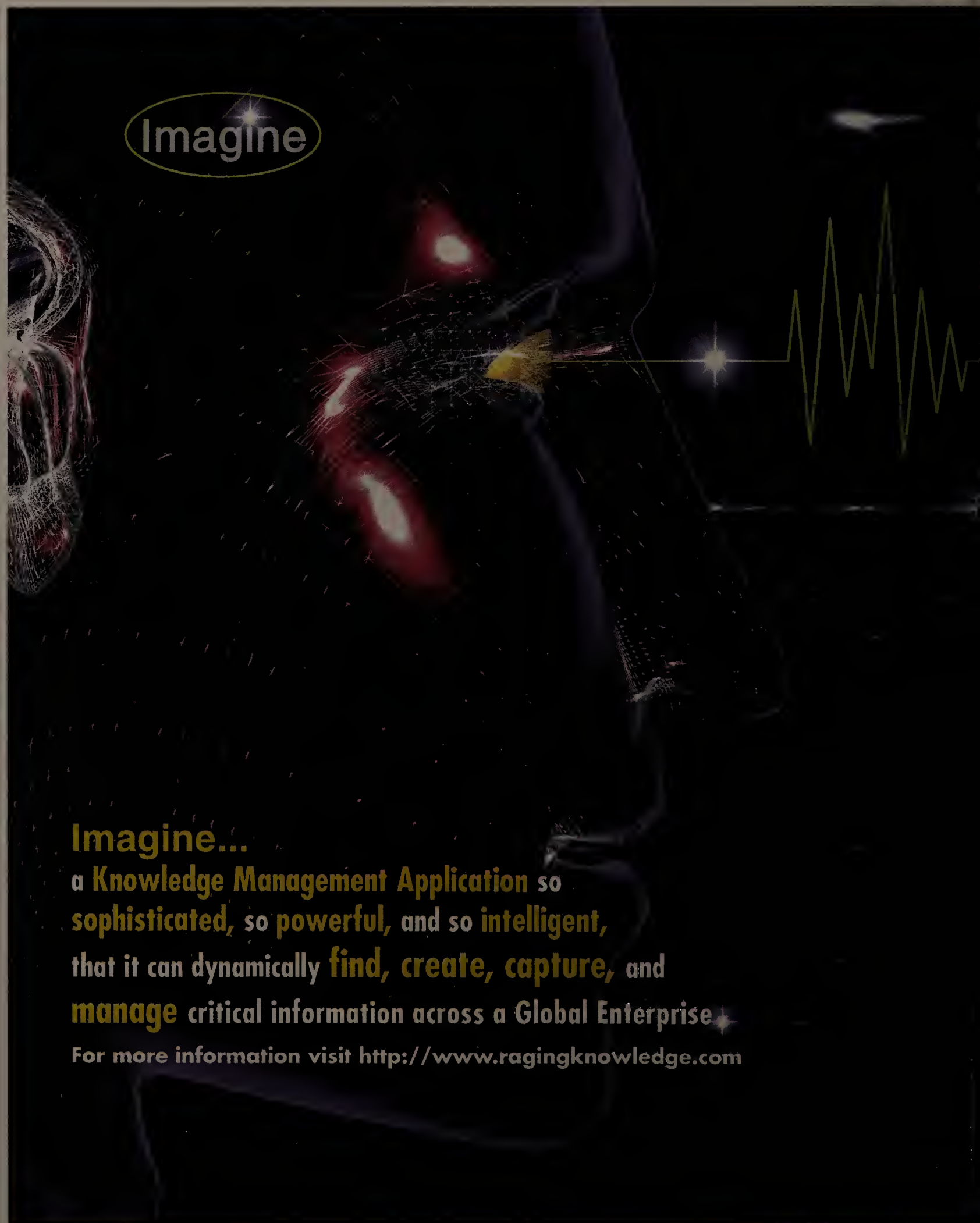
"The more we get away from one-stop shopping from Intel and Motorola, the better off we are," said Bernstein.

Will Transmeta give Intel some needed competition? Probably not beyond its low-power niche, said Halfhill.

"Strangely enough, Transmeta is not putting much pressure on Intel," said Halfhill. "A Transmeta chip is about 10%

more expensive than an Intel Pentium III chip of comparable performance." ▀

Computerworld reporter Linda Rosencrance contributed to this article.



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BRIEFS**New NAS Systems**

Sun Microsystems Inc. has intro-

duced the StorEdge N8000 filer product family of network-attached storage (NAS) systems. The first product, N8200, offers 200 to 800GB and is available in the U.S., starting at \$54,000.

www.sun.com

Syncsort Debuts Data Aggregation Tool

Syncsort Inc. in Woodcliff Lake, N.J., last month introduced Sigma,

a software product that combines a high-powered data aggregation engine with an easy-to-use graphical user interface, according to the company. Sigma's proprietary optimization technique uses a permanent central repository that stores

the aggregate definitions; users can update those definitions and regenerate aggregates with just a few clicks of a mouse.

Data to be aggregated can be input from – and aggregated data can be output to – flat files in a Windows or Unix file system or a relational database management system. Sigma supports the following operating systems or higher: AIX 4.2, HP-UX 10.20, Solaris 2.6 and Windows NT 4.0. Pricing information wasn't available.

www.syncsort.com

Ecix Launches Tape Subsystem

Boulder, Colo.-based Ecix Corp. recently introduced the VXA RakPak, a rack-mountable tape subsystem that uses Ecix's VXA technology for data recording and restoring. The VXA RakPak stores up to 132GB of data. It's compatible with Linux and Windows NT, 95, 98 and 2000.

Shipments will begin this month. Pricing will be set at \$1,299 for a one-drive unit and at \$2,229 for a two-drive unit.

www.ecix.com

Network Appliance Introduces NetCache

Sunnyvale, Calif.-based Network Appliance Inc. recently launched its NetCache C1100 Web caching and streaming media product. The C1100 transparently mirrors content, such as streaming training and executive videos, to end users. The appliance is furnished with one 9GB SCSI hard-disk drive, 256MB synchronous dynamic RAM and dual 10M/100M bit/sec. Ethernet ports and supports multiple T1 connections for HTTP caching and multiple T3 connections for streaming media. NetCache is priced at \$5,950.

www.netapp.com

TrueSAN Line Offers Fibre Channel Support

TrueSAN Networks Inc. in San Jose has introduced the 7000FC series of Fibre Channel storage-area network (SAN) products. Features include 200GB of storage capacity that expands to 7 terabytes per storage subsystem, plus eight nodes of SAN connectivity. The new series offers standards-based management, remote replication and clustering services.

www.truesan.com



Flat's Where It's At

BY RUSSELL KAY

DON'T WORRY ABOUT the cost. Lie to your boss and the purchasing department. Lose the paperwork. Just go ahead and order one of those 18-in. flat-panel desktop monitors, then sit back and enjoy the view.

Yes, these devices still cost upward of \$2,500. No one ever said life was fair.

I've lived with a changing cast of 18-in. LCD monitors for a while, and I'm thoroughly spoiled. There's nothing like them for everyday work. No flicker, tack-sharp images edge-to-edge and corner-to-corner, and good color. Lots of screen real estate lets me have several windows open at once. My eyes have never felt so good.

I tried four monitors: Compaq's TFT8020, Nokia's 800-Pro+, Princeton Graphic's DPP800 and ViewSonic's VP181. The Princeton is a digital-only monitor; the other three will take either analog or digital input. I wanted a video card that could display four monitors simultaneously, but that was a special-order item. So I compared the monitors one by

one, using a Hewlett-Packard Co. Vectra VL600 PC running Windows 2000 with an ATI Technologies Inc. video card that has both digital and analog outputs.

I kept coming back to the Compaq, though the Princeton and Nokia ran a close second. I did prefer using digital mode, because the image appeared on-screen faster and looked just ever-so-slightly better.

A caveat: These monitors were designed to run at 1,280 by 960 pixels, so your graphics card better have 8MB of video memory. Don't expect them to look quite as good at any other resolution. You can set them at 1,024 or lower, but at that resolution, images get distorted and text may look terrible. ▀



computer sulked and didn't want to boot. Eventually, we got the system back to normal, and it ran OK with standard Windows video drivers.

The Nokia seemed to inspire either love or hate. I didn't care for its somewhat dim, low-contrast images. But the editor who had all the software problems still preferred the Nokia to all the others.

Finding this monitor may present a problem, since ViewSonic bought Nokia's monitor business this year.

ViewSonic VP181

ViewSonic Inc.

\$3,395

www.viewsonic.com

Among the monitors I looked at, only the ViewSonic would accept analog, digital and composite television inputs, and it produced the best-looking text at suboptimal resolutions. It could also display at 1,600 by 1,200 pixels, though with a slightly degraded image.

ViewSonic produces some of the best monitors I've seen, so I was surprised at how poorly this unit performed. It just wasn't worth its high price. Although the image was bright and contrasty, I could easily detect ghosting of images with analog input - something I've never seen on other desktop flat-panel monitors.

You can rotate the screen 90 degrees into portrait mode using supplied software. This worked, though it seemed to make the system crash more. Compared with previous rotatable ViewSonic flat-panel monitors, this one had a very even image that, when rotated, could be seen easily from either side, not just from directly in front. It has two built-in speakers and a Universal Serial Bus hub, both nice conveniences. But alas, they aren't enough to make this one a winner. ▴



Princeton DPP800

Princeton Graphic Systems Inc.

\$2,899

www.princetongraphics.com

This model produced very sharp screens, and normal desktop and application windows were the best-looking of all, although the Princeton didn't do quite as well as the Compaq on photographic images. Unfortunately, at less than 1,280-by-960-pixel resolution, its text became the ugliest and most deformed of the lot - close to unusable, in fact. But as long as you can handle the high resolution, this is a very nice monitor indeed.

Compaq TFT8020

Compaq Computer Corp.

\$2,995

www.compaq.com

This is Compaq's second-generation 18-in. LCD desktop monitor. It comes with both the regular VGA analog connector and the newer digital video cable. Its view is landscape-only. The Compaq was a good all-around performer, displaying very sharp text, even at a lower-than-native display resolution. And it has a convenient carrying handle molded into the back of the housing. For graphics, I liked this monitor best.

Nokia 800Pro+

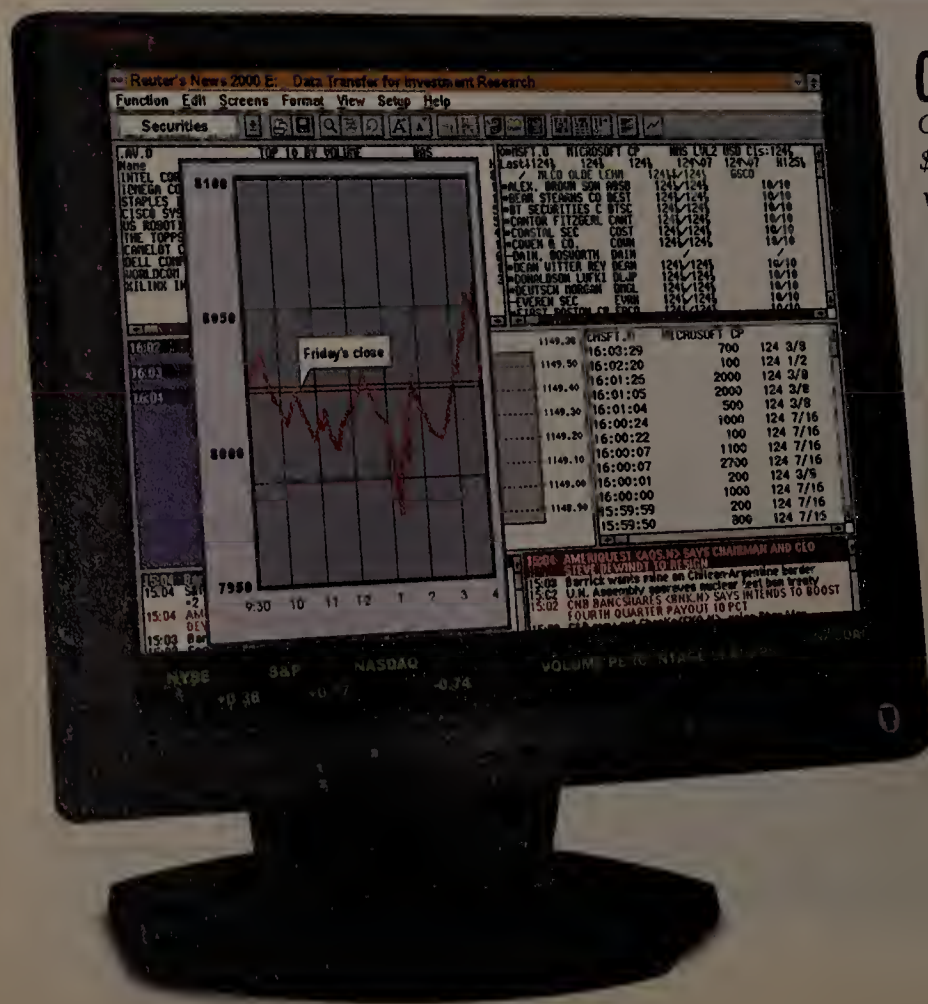
Nokia Display Products Inc.

\$3,399

www.viewsonic.com

The Nokia looks different from the rest of the monitors I tested. Its face plate is quite shiny, giving more reflections than the others, and the large, round controls at the bottom of the screen make the display look almost square. The Nokia produced the sharpest type of all and good graphics. It fell down only in that I had to push it to maximum brightness and contrast, and the image was still darker and duller than those of all the other monitors.

But the software driver and control application that came with the Nokia were taxing. After an initial installation, one editor ran into problem after problem, and even getting rid of the software was quite difficult. When we took it out, the



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CONFERENCE AGENDA

Sunday, June 18, 2000

12:00pm - 5:00pm

Registration

7:00pm - 9:30pm

Pre-Conference Networking Reception

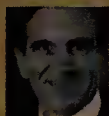
Monday, June 19, 2000

8:30am - 9:00am



Welcome and Opening Overview
Maryfran Johnson, Editor-in-Chief
Computerworld

9:00am - 9:45am



Opening Keynote: "IT Leadership vs. E-Leadership"
Charlie Feld, E-Leader and former CIO, Delta Airlines
CEO, The Feld Group

10:00am - 11:30am



"The Naked Truth About B2B E-Commerce"
Kevin Fogarty, Business Editor
Computerworld

Panelists:
Robert Schwartz, VP & GM, Panasonic Corp. • Kathy Brittain-White, CIO & EVP, Cardinal Health (cardinalhealth.com) • Peter Burrows, CTO, Reebok International • John Keast, CIO/CTO, NetworkOil • Bruce Carver, VP of Information Management and Technology, Reynolds & Reynolds

11:30am - 12:15pm



Insider View: "Raytheon Corp.'s Unfolding E-Business Strategy"
Eric Singleton, Director of Global E-Business
Raytheon

12:30pm - 1:45pm

Interactive Luncheon with IT Leaders

2:00pm - 3:30pm



"Enterprise Security: Will Only the Paranoid Survive?"
Priscilla Tate, President
Technology Managers Forum

Panelists:
Scott Charney, former head of computer crime investigations, U.S. Department of Justice and now Principal, PricewaterhouseCoopers • Allan Paller, Columnist, Computerworld and Research Director, SANS • Tim Talbot, VP of Technology Management, PHH Vehicle Management Service • Bob O'Stefano, CIO, The Vanguard Group • John Puckett, CIO, Toysmart.com

3:30pm - 4:15pm



Afternoon Keynote: "Innovation & Change"
Thornton May, VP of Research
Cambridge Technology Partners

4:30pm - 5:00pm

NCR Presentation

5:00pm - 5:30pm

"Mobilizing E-Business: Handhelds in the Enterprise"
Chuck Yort, VP, Marketing Business and Government, Palm, Inc.

5:30pm - 8:30pm

Expo Open and Reception/Bufferet Dinner

Tuesday, June 20, 2000

8:45am - 9:00am

Remarks and Day Two Overview

9:00am - 9:45am



Keynote: "Lessons Learned on the Net Frontier"
David Lord, CEO
Toysmart.com

10:00am - 11:30am



"ASPs: The Double-Edged Sword of Outsourcing"
Mark Hall, West Coast Bureau Chief
Computerworld

Panelists:
Dick Hudson, CIO, Global Marine • John Voeller, CKO, CTO & SVP, Black & Veatch • Sateesh Lela, President, Lela Consulting Group • Tsvi Gal, CIO, CTO & VP of Mergers and Acquisitions, GBS • Mark Mathias, President, Eureka Digital • James Lubinski, EVP, Galileo International

11:30am - 12:15pm



Featured Speaker: "Strategies for Success in the Internet Economy"
Peter Solvik, Senior Vice President and CIO
Cisco Systems

12:30pm - 2:00pm

Bufferet Lunch and Expo Open

2:00pm - 3:30pm



"Walking the E-Customer Tightrope"
Julia King, Senior Editor
Computerworld

Panelists:
Cathy Hotka, VP, National Retail Federation • Joseph Smialowski, Vice Chairman, Fleet Boston Financial • Robert Rubin, CIO, Elf Atochem North America • Manoj Tripathi, CIO and Vice President, Jamba Juice • Gary Cooper, VP Information Systems, Tyson Foods • John Plummer, IT Division Manager, Corning

3:30pm - 4:15pm



Insider View: "Taking Care of E-Customers at Autobytel"
Ann Delligatta, COO
Autobytel.com

4:30pm - 5:00pm

"Driving the E-Services Economy"
Oeborah Nelson, VP, North American Marketing & Partnering Org.
Hewlett-Packard

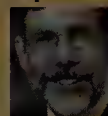
5:00pm - 5:30pm

Premier Sponsor Presentation: To Be Announced

5:30pm - 7:00pm

Expo Open and Reception

7:00pm - 9:00pm



Premier 100 Awards Presentation and Gala Dinner
Featured Keynote: Jim Yost, CIO
Ford Motor Company

Wednesday, June 21, 2000

8:45am - 9:00am

Remarks and Closing Day Overview

9:00am - 10:30am



"How to Win the Hiring War Between the 'Dots' and the 'Nots'"
David Weldon, Careers Editor
Computerworld

Panelists:
Irene Dec, VP of International Investments, Prudential Insurance Co. • Margaret Schweer, HR Director, Kraft Foods • Robert Bruce, CIO, Allinera Financial • David Foote, Managing Partner, Foote Partners LLC • Jim Prevost, CIO, Green Mountain Coffee • Fran Quittel, Columnist, Computerworld

10:30am - 11:15am



Closing Keynote: "Putting All the Pieces Together: The E-Management Difference"
Peter Keen, Author, *The eProcess Edge*, and Chairman
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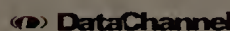
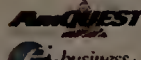
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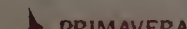
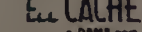


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Wireless Web Access

BY STEVE ALEXANDER

A FUNNY THING happened on the road to handheld, wireless Web access: Microsoft Corp. chose a different route. As a result, analysts are divided over whether handheld Internet devices will rely on data downloads specially configured for minimum size, or on devices that can handle full-featured Web pages and graphics, even on their tiny screens.

Microsoft has chosen the second approach with its new Pocket PC software, while two competing technologies, Web clipping and Wireless Application Protocol (WAP) are designed to streamline access by structuring and reducing the amount of data that a portable device needs to download.

Web clipping, used for wireless Palm Inc. handhelds, works through a special proxy server on a wireless network. Using a special application, the user generates a local query relative to data available on the Internet. The query is sent to the proxy server, which determines what is needed, goes to the appropriate Web sites and retrieves the data. The proxy server compresses the data and sends it back to the Palm, where the query application displays the response. But this works only with predefined types of queries (e.g., weather, airline flights, theater times).

WAP, oriented more toward Internet-enabled telephones, doesn't use a proxy server; instead, it depends on a Web page that's been rewritten for the small screen in Wireless Markup Language (WML).

Pocket Internet Explorer for the Pocket PC is Microsoft's answer. It provides access to full Web-page content because it can reformat pages for better, more appropriate display on the Pocket PC's 320-by-240-pixel color screen.

Some analysts say the Microsoft approach will win out because it doesn't require converting HTML pages to another format for a limited audience of wireless users. But oth-

DEFINITIONS

Web clipping is a technique for reducing the amount of data downloaded to a wireless-equipped Palm handheld computer with its 160-by-160-pixel screen. A proxy server fields queries from the Palm, gets data from Web sites and then sends a compressed response (typically 500 bytes or less) to the handheld unit.

Wireless Application Protocol (WAP) is a standard aimed at delivering condensed Web information to specially equipped wireless telephones [Technology, Jan. 24]. Because these phones have even smaller displays than the Palm devices, WAP downloads are likely to be smaller than Web clipping responses.

Pocket Internet Explorer, a part of Microsoft's Pocket PC software, is a browser that reformats pages on the fly to fit the smaller screen.

ers say there will be so many wireless users that next-generation Web pages will be designed for both wired and wireless downloads; thus, converting from wired to wireless won't be a problem. In the short term, analysts say, all three approaches will be used.

Iain Gillott, an analyst at International Data Corp. (IDC) in Austin, Texas, favors the WAP approach, which he says could be used with the Pocket PC and thus doesn't necessarily compete with it. WAP is likely to spread because more than 300 companies are behind

it, while Palm and its licensees are the chief backers of Web clipping, he says. As for the Pocket PC, Gillott says he's not sure why anyone would want all the PC capabilities on a handheld with such a small screen: "If I want that, I'll use the wireless modem on my PC. I have a hard time believing that a non-WAP-compliant browser will be successful."

Gillott acknowledges that WAP today faces the problem of Web-page conversion — it can be used only if Web sites convert their HTML into WML for WAP access

[Technology, Jan. 24]. But he says that's just a short-term problem: By the end of 2002, there may be more people with wireless Internet access than are accessing the Internet through a desktop PC. "Suddenly, the webmaster designing a new Web site sees that he or she has two kinds of users — wireless and desktop — and needs to cater to them both from Day 1," Gillott says.

WAP faces other criticisms, but Gillott predicts they'll disappear. "People are hung up on WAP today. They say its user interface and security aren't

very good. But this is Version 1.1, which I'd equate to Netscape 1.0. I think WAP will evolve very quickly, that versions 4, 5 and 6 won't look like Version 1," Gillott says.

Is More Better?

Jill House, a senior analyst at IDC in Framingham, Mass., says she likes Microsoft's approach. The Palm and WAP approaches require too much Web site programming, she says, and won't reach big-enough audiences. Most wireless Palm applications require that Web sites be rewritten to fit a Palm Query Application (PQA), which handles data requests. "People with Web sites to run have enough to do without creating a PQA for a limited audience," she says. "The gating factor is volume. If you can show people who run Web sites that there will be a significant volume of activity, they will develop for it."

Web clipping will probably disappear, while WAP may yet become part of the eventual wireless download solution, House says. Microsoft's approach of shrinking Web pages to fit portable-device screens will deliver a usable view for some types of Web pages and not for others, she says.

Jane Zweig, executive vice president at Herschel Shostack Associates Ltd., a Wheaton, Md., consulting firm, says that as wireless speeds increase, neither WAP nor Web clipping will appeal to users. Wireless downloads of 2M bit/sec. are possible, but it may take years.

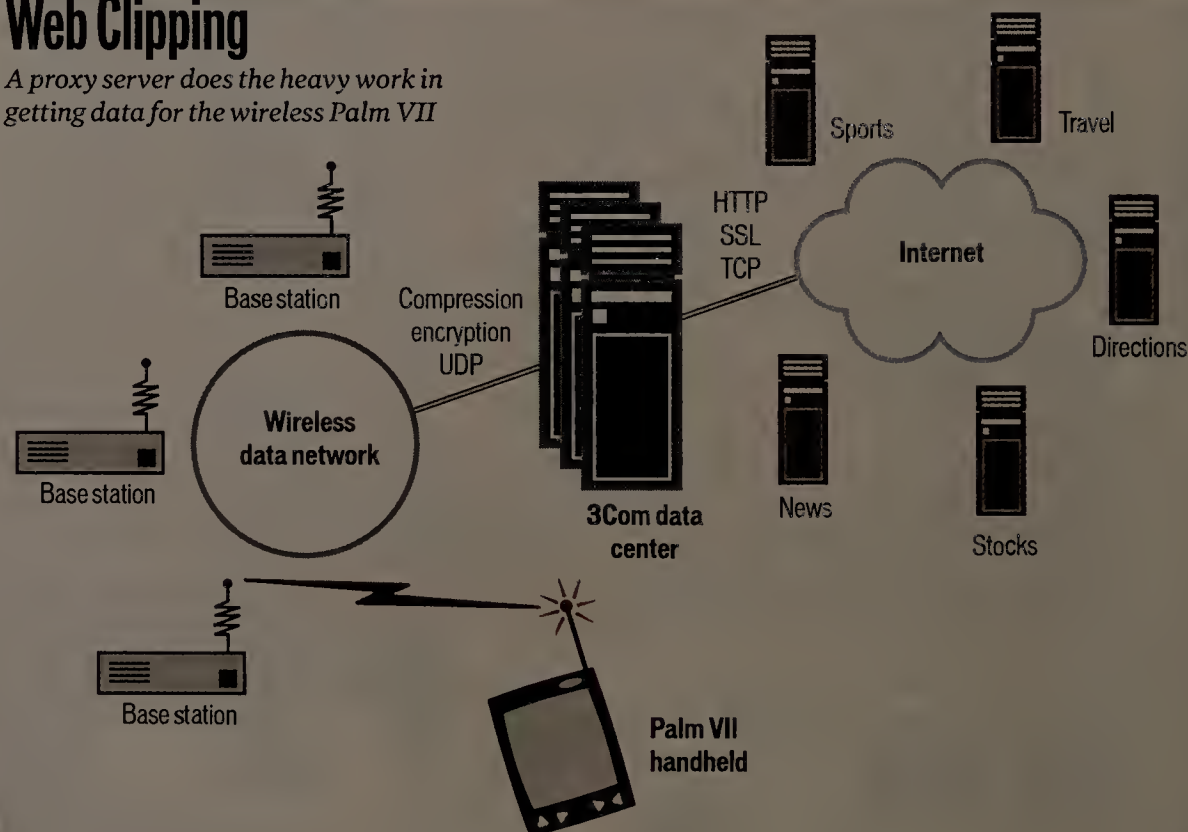
"I'm not saying people will do all the browsing on a phone that they do on a PC with a landline today. But ultimately, the limited content available will diminish the value proposition" of WAP and Web clipping, Zweig says.

The trouble with the debate over wireless download techniques is that none has a track record of either cost or demand, Zweig says. ▀

Alexander is a freelance writer in Minneapolis. Contact him at sorion99@yahoo.com.

Web Clipping

A proxy server does the heavy work in getting data for the wireless Palm VII



Undercover Agents

Their roots in artificial intelligence make them creepy to some, but as computing bots and agents become increasingly pervasive, their potential is enormous.

By Steve Ulfelder

YOU KNOW that beady-eyed paper clip that stares at you from your Windows 98 applications? It's an intelligent software agent. It's a cool one, too — though most people will never know that, because they switch the creepy thing off as soon as they can.

Perhaps because of their roots in artificial intelligence — a field that overpromised itself into exile — agents were once viewed as a technology always set to explode...next year.

But they have exploded, albeit quietly. There are plenty of software agents in use today. They're in help systems, many search engines and comparison-shopping tools. But you ain't seen nothin' yet.

During the next few years, as technologies mature and agents radically increase their value by communicating with one another, they will significantly affect your company's business processes. Training, decision support and knowledge sharing will be affected, but experts see procurement as the killer application of business-to-business agents.

Intelligent software agents, also known as "bots" (short for "knowledge robots"), are programs that autonomously help users accomplish certain tasks. Agents, which can be written in a variety of programming languages, feature triggers that allow them to execute without human intervention. Most

agents also feature adaptive learning of users' tendencies and preferences and offer personalization based on what they learn about users.

One goal of software agent developers is to fulfill the age-old promise that machines will perform tasks that humans don't want to do. Another is to delegate to machines tasks at which they are vastly superior to humans, such as comparing the price, quality, availability and shipping costs of items.

J. D. Knode, editor of the Web site BotKnowledge.com and a graduate student at the University of Baltimore, says agents can automatically perform intelligent searches, answer questions, tell you when an event occurs, individualize news delivery, tutor and, of course, comparison-shop.

Facilitating Change

As neural networks and other linchpin artificial intelligence disciplines improve, and as evolving standards let agents hop from system to system and communicate with one another, the value of bots may increase geometrically. An IBM Research Web page sums up the outlook: "We envision the Internet some years hence as a seething milieu in which billions of economically motivated software agents find and process information... Agents will naturally evolve from facilitators into decision-makers."

E-commerce is a key focus of

agent activity. Take comparison-shopping bots such as mySimon Inc.'s and extend their premise to corporate purchasing and procurement, and you've got what Alexander Linden, a senior analyst at Gartner Group Inc. in Stamford, Conn., calls "the hot issue" for agents.

Web-based exchanges such as the one recently formed by the Big Three automakers are enabled by agent technology. "I can compare prices, quality and availability when I'm buying textbooks. If I'm GM, why not do the same thing when I'm buying 700 million tons of steel?" Knode says.

Linden also points to financial arbitrage as a logical application for agents. Tracking currency changes, seizing on a stock's "float," computing minute advantages and executing deals within fractions of a second are jobs best performed using computer horsepower.

Of course, not every application needs to earn or save billions. Pattie Maes, an associate professor at the MIT Media Laboratory, has long been at the forefront of agent development. As early as 1994, in a speech she gave at the Doors of Perception 2 Conference, Maes described the need for software agents.

"I'm convinced that we need [software agents], because the digital world is too overwhelming for people to deal with, no matter how good the interfaces we design," she said. "There is just too much information."

Much remains to be done before software agents realize their potential. If agents are to collaborate and form a vast network of superprocurers, standards must take hold to address communication and security issues. The Defense Advanced Research Projects Agency is working on developing the Knowledge Query and Manipulation Language, which will double as a message format and a message-handling protocol.

As agent-based commerce takes hold, ethical and legal issues are sure to arise, because "so many new business models are based on crawlers, agents and so on," says Linden.

Agents are sure to revolutionize industrial espionage, too. If you're not already paranoid about guarding your corporate data, check out Chicago-based Spyonit.com Inc.'s Web site. Its free tool sends bots out to gather information. It's easy to imagine using it to issue commands such as "Beep me when my competitor's org chart changes."

If nothing else, agents serve as another reminder to brush up on security procedures. ▀

Ulfelder is a freelance writer in Southboro, Mass. Contact him at ulfelder@earthlink.net.

I'm convinced that we need [software agents], because the digital world is too overwhelming for people to deal with, no matter how good the interfaces we design. There is just too much information.

PATTIE MAES, ASSOCIATE PROFESSOR, MIT MEDIA LABORATORY



Packaged Portals

Buying a carefully tailored off-the-shelf portal can be more cost-effective than building your own. By Lamont Wood

BUILDING AN enterprise portal to provide browser-based views of legacy data may sound simple, but it isn't.

Portals require the integration of a wide range of core corporate databases, as well as the ability to analyze data and personalize user interfaces.

Some customers and consultants have found that buying packaged portal software can cost as little as half as much as writing your own interface and data-integration tools. Deployment times, they say, can be only a third as long as the time needed to build a portal in-house.

Even so, creating a portal with even basic functions will usually cost at least \$50,000 for the software itself, says Henry Morris, an analyst at International Data Corp. in Framingham, Mass. Installation, customization, training and business-process changes can double that expense, he says.

Getting a portal up and running can cost \$100 to \$300 per user, although the per-capita cost begins to fall off sharply at more than 2,000 users, says Randy Eckel, CEO of InfoImage Inc., a portal development firm in Phoenix. Most pilot projects cost \$100,000 to \$200,000, with final deployments costing some multiple of that, he says.

Some analysts and users say they agree that selecting software carefully can help minimize the costs. But choos-

ing that software isn't easy, because many of the packaged offerings are still immature or untested, notes analyst Madan Sheina at Aberdeen Group Inc. in Palo Alto, Calif.

A fully functional portal must provide access to structured data (which is organized in fields) and to unstructured data such as text, says Eckel.

It also must provide personalized views to help users sort through reams of data and allow them to take some action such as analyzing information or completing a transaction.

Using a staged approach can make the process easier to justify, says John Ulery, a product manager at Computer Associates International Inc. in Islandia, N.Y. "But the planners need to see it as a process of building an infrastructure, a foundation for the future, rather than a single solution that is larger than life," he says.

The following three user sites are examples of companies where information technology staffers were able to configure portals, spending what they felt was a minimum amount of money and time.

No Portal, No Business

Before eTime Capital Inc. could even begin doing business, it needed a portal. The Sunnyvale, Calif.-based company gathers information about when products are received by customers and provides that information to manufacturers over the Web. The producers can then more closely track how soon

they should be paid, says Ricardo Jenez, eTime's chief technology officer.

The service lets users track their accounts receivables in real time, instead of on monthly cycles, which both increases cash flow and makes that cash flow more predictable, he says.

Software agents written by eTime are placed in the systems of its customers and their shipping carriers to collect key documents, Jenez says. These documents include sales orders, bills of lading, invoices and credit memos, all of which are converted into XML in eTime's Oracle database and analyzed.

To make it all possible, simple database access wasn't enough. Strong analytical and data presentation tools were also needed, Jenez says. The company tried other tools before settling on the Brio One product suite from Brio Technology Inc. in Palo Alto, Calif.

"Some were very good at reporting, and some were very good for what-if analysis, and some were good at the portal end [for data access and presentation]. But Brio was the only one with the complete integrated package," says Jenez.

The suite includes Brio.Enterprise, a business intelligence product for data analysis and presentation; Brio.Portal, for the portal interface; and Brio.Report, for batch reporting. A company spokesman says pricing for Brio One starts at \$50,000.

eTime executed the contract with Brio in mid-December and had a beta version of its portal in February. The full service was launched in early April.

"We can't talk about the cost, but Brio was extremely competitive — much better than some of the others," Jenez says. "Some were dramatically more expensive, and none were dramatically cheaper."

A Microsoft-Centric Approach

A customer portal was also the aim of the California Casualty Group in San Mateo, Calif., which sells home and automobile insurance. Senior Vice President Beau Brown says the idea was to create a self-service portal where policyholders could view their policy information, request changes and file claims.

"The main thing we were interested

in was a friendly interface, but quite a few portal [tools] had that," Brown says. "So beyond that, we were interested in the ability to interface to legacy systems."

The insurer's legacy applications ran on an IBM mainframe, with data stored in a DB2 database. For another project that involved offering real-time quotes over the Internet, the company had been "wrapping" the existing code with Active Server Pages (ASP) and Component Object Model (COM) technology from Microsoft Corp., Brown says. California Casualty chose Plumtree Corporate Portal from San Francisco-based Plumtree Software Inc. because it's based on ASP and COM.

The other chief attraction was the ability to cost-effectively perform complex customization of the user interfaces, Brown says. California Casualty markets its products through groups and associations, and the Plumtree interface could be personalized ac-

cording to customers' memberships, Brown adds.

Four California Casualty staffers attended a three-day Plumtree training course and were then able to put together a system to display billing and policy information in just 10 days. "Some of the portal [software] for things like accessing the glossary and searching the Web site were created in a matter of hours," Brown recalls.

"We came in well under budget and did not spend a lot on consulting services," he says. "It proved a lot cheaper to buy a portal product than to build one ourselves."

Brown says the cost was less than \$200,000 for the software and consulting, which "was reasonable compared to the payback to our customers," he notes.

Offering real-time policy quotes will require that all the legacy systems be Web-enabled, a function Brown says he expects to see by year's end.

Meanwhile, customers appear to

have better data access than employees, but Brown says he plans to add an employee portal next year on the firm's intranet.

Sticking With What's Familiar

In the East Baton Rouge Parish School System in Baton Rouge, La., IT managers decided to build a portal while upgrading from a legacy mainframe to a client/server system, says Bettye Whaley, the school system's program manager of information systems.

Previously, the school system used paper documents, which were input in batch mode to a Unisys Corp. mainframe. "But because we wanted an on-line system" and were dissatisfied with several financial packages the district ran, says Whaley, "we decided to do a major overhaul."

Moving to the client/server environment was less expensive than upgrading the Unisys box, Whaley says. The portal also lets school staff generate and view reports on school district data from their browsers, she notes. Now, each of the district's 101 school sites — hosting about 57,000 students and 12,000 full- or part-time employees — is connected to an intranet based on T1 lines.

The new payroll/financial and student information systems were implemented on July 1, the start of the district's fiscal year. But legacy data and several secondary packages remained on the mainframe.

However, after choosing the financial package and the student information package, the district ended up with two different database environments: Oracle on Windows NT for the financial system and Informix on Unix for the student information system, in addition to the legacy data on the Unisys system. That meant three separate platforms on which to run reports, Whaley says, with no ad hoc reporting tool to use.

To access the Unisys data, the district had been using a reporting tool called Ursa from Decision Support Inc. in Matthews, N.C. Its spin-off, Metagon Technologies LLC, also in Matthews, had begun offering similar Web-based multisource reporting tools, including DQvista and access tool DQbroker.

"At the time, we did not look at anything else — we needed something fast, and since we knew how to use Ursa, there was no learning curve," Whaley recalls.

Because the district could stop paying for some mainframe applications, the \$30,000 cost for the tools was partially covered, she says.

"You can set up a report in 10 minutes or less, if you know your data," says Brad Mallett, a programmer/analyst at the school system. ▀

Wood is a freelance writer based in San Antonio.

ETime Capital Inc.

Portal used for: Providing customers real-time access to shipping information

Product chosen: Brio One from Brio Technology Inc.

Reason: It was the only tool evaluated that included reporting, analysis and data access and presentation capabilities.

California Casualty Group

Portal used for: Allowing policyholders to view policy information, request changes and file claims

Product chosen: Plumtree Corporate Portal from Plumtree Software Inc.

Reason: Plumtree's tools were based on Microsoft technology already used by the customer, and they offered cost-effective customization of customer views.

East Baton Rouge Parish School District

Portal used to: Provide a single view of data stored on both mainframes and client/server systems

Product chosen: DQvista and DQbroker from Metagon Technologies LLC

Reason: The customer was familiar with an earlier mainframe-based reporting tool from the same vendor.

BETTYE WHALEY says her school district chose portal software from Metagon Technologies because the district was familiar with an earlier mainframe-based reporting tool from the vendor

Can You Translate That for Me Please?

XMLSolutions' EDI/XML translator automates document exchange processes

BY AMY HELEN JOHNSON

MIKE GIESLER, vice president of business development and technology at Richmond, Va.-based Envera LLC, is building an on-line trading hub for chemical companies. He wants the site to run smoothly, but he must solve a major problem first: automating the bill-paying process. After all, a high-tech transaction that ends with employees shuffling paper would lose its new-millennium shine.

Envera is a global electronic marketplace for business-to-business transactions and services that was established earlier this year by an international group of chemical and petroleum companies.

Giesler turned to McLean, Va.-based XMLSolutions Corp. for an approach that relies on the content-tagging language XML to translate electronic data interchange (EDI) information into business objects that anyone in the marketplace can read and process. XMLSolutions' XEDI Translator was a natural fit, he says, because its focus is on marrying XML, the emerging lingua franca of inter-company data sharing, with EDI, which large chemical companies use for bill processing.

EDI systems handle 20% of the transactions at the major chemical industry players, and about one quarter of all industry companies have EDI capabilities, Giesler says.

Saving Grace

Vendors have traditionally seen EDI translation as a way to get two similar but incompatible systems to talk to each other, says Kate Fessenden, an analyst at Boston-based Aberdeen Group Inc. This perception arose because EDI evolved into slightly different flavors. As long as a company had a limited number of trading partners, the information technology staff could handle a

few variations. More partners meant more complexity.

Now, with a transformation engine like XEDI Translator, she says, IT can toss out the one-to-one software adapters. The new paradigm is to translate EDI into XML, checking for errors in code, formats and sequences along the way, to format the document accord-

ing to the receiver's preferences and place it in a browser window.

"XML is breathing life back into EDI," Fessenden says. "Companies that have gone through the huge expenditure of investing in EDI don't have to worry about it going away and being replaced by any other technology." In addition, smaller companies that didn't have the resources to support EDI can now join these trading communities with a smaller investment in XML.



EDI-to-XML tools could mean big cost savings, according to company CEO Kevin Kail

XMLSolutions Corp.

Location: 7929 Westpark Drive, Suite 100, McLean, Va. 22102

Telephone: (877) 965-9657 or (703) 506-1111

Web: www.xmls.com

Niche: Bill payment and document exchange via XML

Why it's worth watching: Allows IT to retain its investment in EDI

Company officers:

- Kevin Kail, co-founder and CEO
- Edwin Miller, president

Company goal: To become one of the top players in the business-to-business e-commerce space

Milestones:

- June 1998: Company founded
- February 2000: XEDI launches
- April 2000: Schema Central launches, Meta-X debuts

Employees: 135, growing 80% yearly

Burn money: \$20 million from First Analysis Venture Capital, Opticality Ventures and Schoffstall Ventures

Products/Pricing: XEDI Translator, \$25,000; Schema Central, \$25,000; Meta-X, starts at \$10,000; Vocabulary Builder, \$30,000

Customers: Envera, Advanced Marketing Services Inc. and Kaiser Permanente Health Plan Inc.

Partners: IBM, General Electric Information Services, Bluestone Software Inc. and others

Red flags for IT:

- Expect to see competing offerings from major vendors
- Translators aren't available for all enterprise applications beyond EDI

To benefit from XEDI Translator, a company can't be too small, says XMLSolutions CEO Kevin Kail. If your current costs for handling documents are less than \$10,000 per year and the system works well, keep using it, he advises.

XMLSolutions' target customers are companies that spend more than \$10,000 per year to shepherd documents through their offices, have more than 100 trading partners and currently support EDI, Kail says.

Cost savings is the major benefit of the XEDI Translator, Kail says. He claims that the product can decrease overhead ranging from \$30 to \$100 for processing an invoice to \$2 per document. Fessenden estimates the cost savings at a more conservative 70%.

Competitive Drive

Fessenden says the competition is more customized and less flexible. By using XML, a general-purpose metalanguage, companies can continue using their EDI infrastructures. XMLSolutions adds a layer for flexibility, eliminating the time and expense involved in implementing a new system.

It bases the translations on general-purpose technology, so a change in a company's infrastructure won't break the process. XML translation is also bidirectional, so a firm can both send and receive documents.

Finally, XML can handle language translation, so French and Italian companies, for example, can trade and see documents in their native tongues.

Kail said the firm's products still have room for improvement. XMLSolutions has embarked on projects to improve XML Translator's communication capabilities, expand the document type definition and schema database and increase security features.

XMLSolutions' products are young, acknowledges Fessenden, but they're good enough to fulfill the needs of large corporations. "It's like the next wave of how to deal with EDI — the next leap of technology," she says, noting that XMLSolutions is the company that others need to catch up with. ▀

Johnson is a Computerworld contributing writer in Seattle.

the buzz

STATE OF THE MARKET

The Big Picture

The market in which XMLSolutions operates is in flux, says Kate Fessenden, an analyst at Aberdeen Group. EDI translation isn't the only problem, she says. The underlying business need includes elements of enterprise application integration, a larger area that involves tying together diverse business applications for better data sharing and more powerful analytic opportunities.

Another issue is business-to-business integration — the linking of a company's value chain of partners, suppliers and distributors so that information and operations flow more smoothly.

The stalking-horse here, EDI translation, has been attacked in two ways: through value-added networks, whose advantage is an established EDI infrastructure that others can tap; and through adapters, which tackle each EDI-to-EDI translation separately.

XMLSolutions and its newer competitors are trying to create a *Star Trek*-type solution, a universal translator that will also contribute to the expanded goals of integrating applications and business partners.

Netfish Technologies Inc.

Santa Clara, Calif.

www.netfish.com

Netfish is firmly in the EAI camp, using XML as the glue to bind the companies in a value chain. It has a large war chest, having secured \$30 million in financing from Oracle Corp. and Bain Capital Inc. in April.

OnDisplay Inc.

San Ramon, Calif.

www.ondisplay.com

OnDisplay takes an adapter approach, which is a more expensive solution because its one-to-one translators require constant upgrades, says Fessenden. Recently acquired by Vignette Corp., OnDisplay has plenty of backing.

WebMethods Inc.

Fairfax, Va.

www.webmethods.com

WebMethods' platform for business-to-business integration is more of a shotgun approach than what Fessenden calls the "rifle shot" strategy of XMLSolutions. WebMethods does intercompany integration, a piece of which is hooking together EDI systems. The difference is that WebMethods' approach requires some programming on top of the application.

— Amy Helen Johnson

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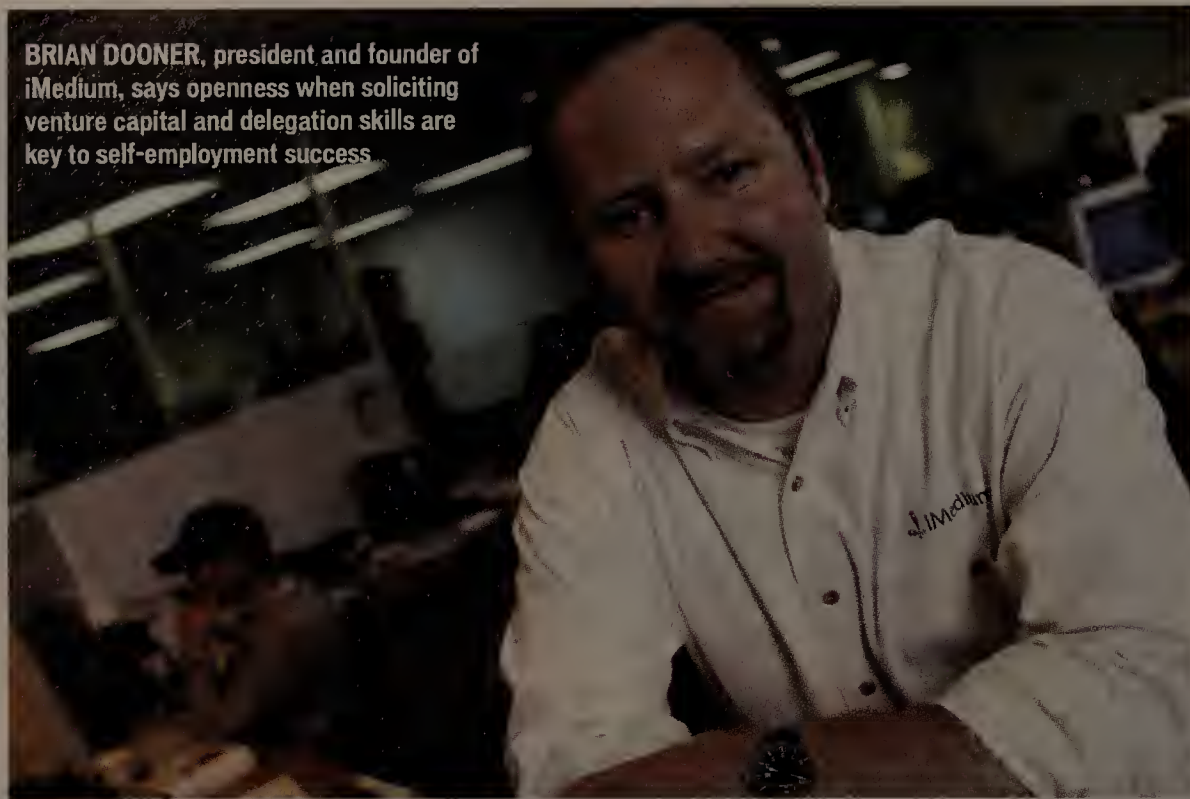
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BRIAN DOONER, president and founder of iMedium, says openness when soliciting venture capital and delegation skills are key to self-employment success



Going It Alone

Dreaming of hanging out your own shingle? Here are words of wisdom from two people who have done it. By Bronwyn Fryer

WORKING FOR a company certainly has its positive points. After all, a regular salary, paid vacations and health care go away the minute you quit the cubicle to strike out on your own.

Still, making the move from employee to employer is unquestionably exciting. And if you do it right, you can find working for yourself to be the most satisfying job in the world. The following profiles offer a glimpse of what it's like to go it alone.

BRIAN DOONER
President and founder
iMedium Inc.
Wayne, Pa.

Brian Dooner's idea — to create a new way for businesses to market on the Web — had gnawed away at him since he was a principal and “de facto CIO” at TL Ventures, a venture capital firm in Wayne, Pa. His brainchild became iMedium, a 43-employee firm that has invented a technology for “visual e-business” — embed-

ding advertising and promotional links directly into images on the Web.

Previous experience: Dooner began his career in the computer auditing and information technology consulting group at Ernst & Young International in New York. He then moved into a variety of financial, operating and investment-banking jobs at Safeguard Scientifics Inc., an Internet holding company. During his seven years at TL Ventures, Dooner became an experienced venture capitalist.

Getting started: In May last year, Dooner developed a business plan and presented it to his previous employer, Safeguard Scientifics, and its affiliated venture capital firms. He also received \$5.5 million in seed money. In February, the same funders provided \$7 million to further develop and market the idea.

In seeking venture capital, Dooner says, don't be hesitant about divulging your business plan. “There's nothing more frustrating to a venture capitalist than an entrepreneur that is

timid about revealing an idea. It wastes both parties' time.”

Staffing up: The most important thing to ask yourself, Dooner says, is, “What will the management team look like?” Assembling a well-rounded management team — including nontechnical marketing and financial planners — should be a top priority, says Dooner.

“The typical, fast-moving start-up hires at least 50 people in its first year of operations — and often before any real

revenue comes in the door.”

Don't make all the decisions. “Leave most of them to well-chosen senior managers. Consider hiring an HR consultant for two or three days a week to take pressure off during the ‘incubator stage,’ when staffing is critical,” Dooner says.

Marketing and sales: Again, leave it to the experts. Hire someone with the skills and experience to sell the product or service. The approach should be “both focused and flexible,” says Dooner.

Challenges and rewards: “There is no substitute for the experience you get as an entrepreneur. If you can bear the economic risk, there is no downside careerwise.”

GUILLERMO PAYET
President and CEO
Ocean Group
Santa Cruz, Calif.

As a systems engineer at IBM for six years, Guillermo Payet was amazed at big-company inefficiencies. “The bureaucracy was stifling,” Payet says. “So much energy went into politics.”

So in 1997, Payet left to start Ocean Group, a seven-employee Internet engineering firm he runs out of a house-turned-office in the beach city of Santa Cruz. His goal was to craft a company that would be non-hierarchical and efficient. He also says he wanted employees to thrive in a creative, “laid-back” environment.

Getting started: Like Dooner, Payet emphasizes the importance of a solid business plan. But unlike Dooner, he started the company with his own savings and credit cards. Since then, he's been bootstrapping.

Ocean Group has “gone with the cash flow,” which can be sporadic. Now Payet is talking

Just the Facts

Name and title: Guillermo Payet, president and chief technology officer

Company and location: Ocean Group in Santa Cruz, Calif.

What company does: Internet engineering

Why he attempted it: Payet says he was tired of working for big business and wanted to run a happy, socially responsible company.

Skills required: Deep understanding of Internet technology,

resourcefulness, versatility and problem-solving and people skills

Resources needed: “Infinite patience and stamina, room on your credit card and a sense of humor.”

Earning/success potential: If the company does well, limitless. But beyond monetary rewards is “the satisfaction of realizing your own vision,” he says.

Career impact: “As an entrepreneur, you have the potential to create your dream job.”

Advice: “Focus on company culture and long-term, rather than short-term, goals. Have fun!”

Just the Facts

Name and title: Brian Dooner, president and founder

Company and location: iMedium Inc. in Wayne, Pa.

What the firm does: Develops new ways of doing e-commerce by embedding marketing information and links within images on the Web.

Why he attempted it: Dooner says he wanted to try his own idea after working with successful start-ups at a venture capital firm.

Skills required: Ability to set strategic direction, develop a strong management team and manage day-to-day operations

Resources needed: A strong management team and CEO plus \$5.5 million in capital

Earning/success potential:

Dooner says he hopes to remain a leader in enabling both business-to-business and business-to-consumer e-commerce through interactive visual content.

Career impact: “Regardless of success or failure, taking the risk of starting your own company is looked upon favorably.”

Advice: Hire a CEO. “A mistake many entrepreneurs make is not recognizing the value of bringing in a CEO in order to maximize the value of the company and its likelihood of success.”

with angel investors to grow the company. “You've got to plan well and have emergency sources of funding,” he says.

Staffing up: Choose employees for their intelligence and their fit with the company's culture, Payet says. Carefully define each person's role so you don't step on each other's toes.

Marketing and sales: Payet warns against too much business too fast: “If you want to build something viable, you want to grow only as fast as you can keep clients happy.”

Challenges and rewards: Going from a large company to starting a successful business has been a long learning process for Payet, and he's had his share of 24-hour days. But the payoff is more than just monetary. “That my dream is coming true is the main reward, and that I'm doing it my way,” he says. ▀

Fryer is a freelance writer in Santa Cruz, Calif.

“When I think about leadership, I believe it's mostly about vision, growing talent and communication. The great ones focus on these things with a passion, and are not swayed by alligators in the swamp. You don't have to be born a leader to emerge a leader. True leaders learn something new about leadership everyday.”

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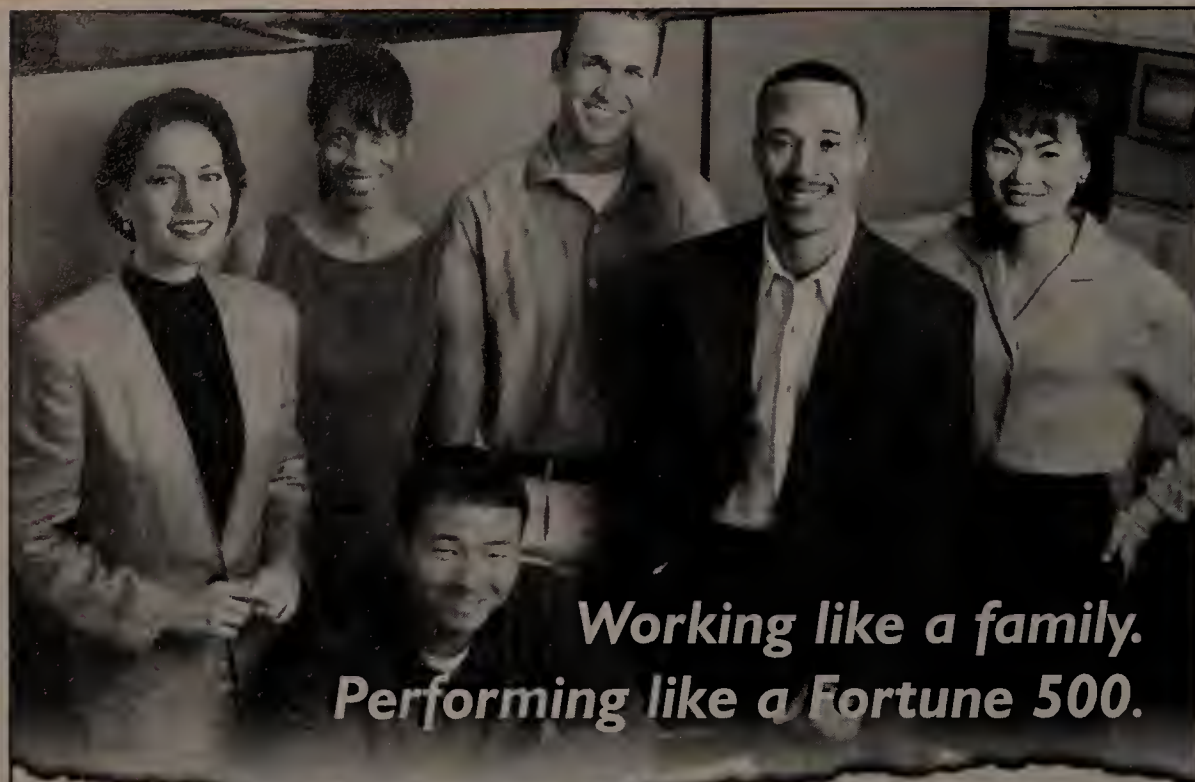
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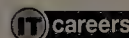
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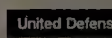
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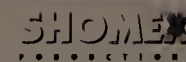
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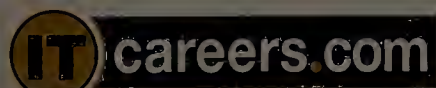
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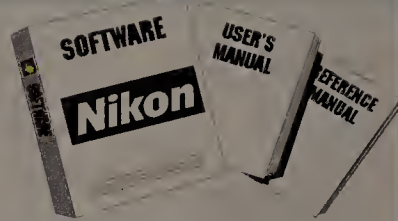
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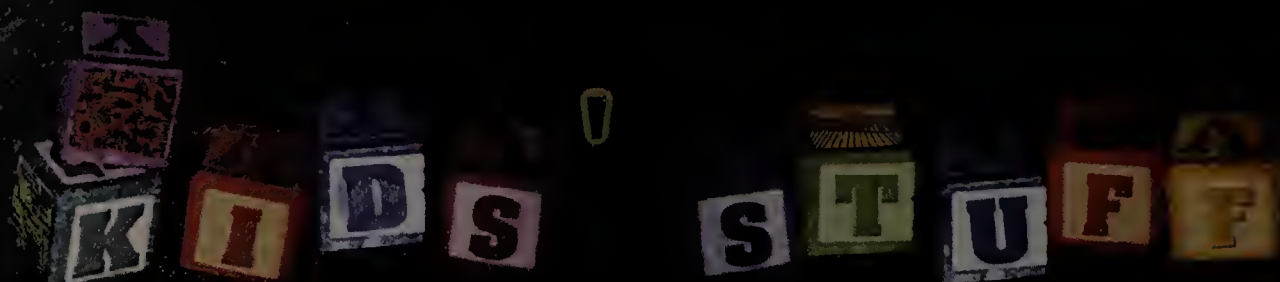
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Programmer Analyst (Unix Networking/Sys. Admin. & Sys. Prog.): Install, customize and fine-tune Accounting operating system on heterogeneous platform. Fine tune application packages such as Relational Database Management Systems under Windows 95/98 NT (client server)/NT2000 operating system, and develop customized modules, forms, queries and reports in the Accounting system through Visual Basic Application (VBA). Maintain client server and WAN connectivity with heterogeneous hardware platforms using routers and/or gateways over leased and dedicated circuits. Secure and maintain multiple workstation connectivity through networking technologies (such as knowledge of Internals on operating systems for patching and coding device drivers), network programming using ODBC and Visual Basic, systems configuration management of hardware equipment and software applications and by performing fundamental and advanced network troubleshooting. Manage TCP/IP based services such as FTP, TELNET, EDI, etc. as well as provide fault tolerant printer troubleshooting and maintenance services. Develops and executes system backup management procedures. Req: Bachelors degree in comp. sci. - math/engr'g/sci./bus.-commerce (or equiv.) & 2 yr exp in job or as software engineer/systems analyst. Must have appropriate combination of skills as follows: 1 of A & 2 of B or 1 of D; or 1 of A & 2 of B & 2 of C; or 1 of A & 2 of C & 2 of D as follows: A) Operating Sys.: IBM AIX, HP-UX, Sun Solaris, DEC Open VMS/Unix, SCO Unix/ODT, USL Unix SVR4, UnixWare; B) LAN/WAN Connectivity/Networking Protocols: TCP/IP, IPX/SPX, NFS, Bridges, Routers, Gateways, X.25, K.400, ISDN, ATM; C) System/Network Program: Perl, Korn, Shell, C Shell, RCP, TLI, Streams, SOCKETS, API & toolkits, DDK, AWK, SED, LEX, YACC; D) Networking techs: Ethernet, Token Ring, FDDI, high mobility preferred (multiple positions). 40 hrs/wk; \$56,615 - \$75,000/yr. Report/submit resume to Terry Kinney, Mgt., Armstrong county Job Ctr., 1270 N. Water St., Box 759, Kittanning, PA 16201. Web 96616.

Programmer Analyst (UNIX Networking/Sys. Admin. & Sys. Prog.): Install, customize & fine tune performance of operating sys. on heterogeneous platforms. Achieve connectivity of workstations using networking technologies. Perform sys. configuration mgmt. for both h'dware & s'tware. Provide user support & network trouble-shooting services. Carry out performance tuning of application packages such as Relational Database Mgmt. systems (RDBMS) under Unix operating system. Manage TCP/IP based services such as NFS, NIS, TFTP, TELNET, etc. Perform network mgmt. using SNMP & related tools. Ensure fault tolerant printer services & back-up mgmt. procedures. Utilizing knowl. of installation of WAN connectivity w/heterogeneous h'dware platforms using routers &/or gateways over leased & dedicated circuits. Using knowl. of internals on operating sys. for patching & coding device drivers & network program'g using IP/IPX, TLI, Streams & SOCKETS. Req: Bachelors degree in comp. sci. - math/engr'g/sci./bus. commerce (or equiv.) & 1yr exp in job or as software engineer/systems analyst. Must have appropriate combination of skills as follows: 1 of A & 2 of B or 1 of D; or 1 of A & 2 of B & 2 of C; or 1 of A & 2 of C & 2 of D as follows: A) Operating Sys.: IBM AIX, HP-UX, Sun Solaris, DEC Open VMS/Unix, SCO Unix/ODT, USL Unix SVR4, UnixWare; B) LAN/WAN Connectivity/Networking Protocols: TCP/IP, IPX/SPX, NFS, Bridges, Routers, Gateways, X.25, X.400, ISDN, ATM; C) System/Network Program: Perl, Korn, Shell, C Shell, RCP, TLI, Streams, SOCKETS, API & toolkits, DDK, AWK, SED, LEX, YACC; D) Networking techs: Ethernet, Token Ring, FDDI; high mobility preferred (multiple positions). 40 hrs/wk; \$56,615-\$75,000/yr. Report/submit resume to Sue Notarnicola, Supervisor, Uniontown CareerLink, 32 Iowa Street, Uniontown, PA 15401-3513, Web 96633.

Programmer Analyst - SAP Specialist: Structured systems analysis, process engr'g, design, configuration, prototyping, development, testing, QA, implementation, integration, maintenance & knowledge transfer of SAP R/2 & SAP R/3 systems for business, financial, banking, mfg & other commercial application systems in a multi-hardware environ. using centralized or distributed Relational Database Mgmt Systems (RDBMS), Fourth Generation Languages (4GLs) & other GUI (Graphical User Interface) front-end tools. Req: B.S. in comp. sci. or engr'g (or equiv.) & 1 yr exp in job offered or as programmer analyst/systems analyst. Must have appropriate combination of skills as follows: 1 of A & 2 of B; or 2 of A & 1 of B; or 2 of A; or 2 of B. A Includes FI, CO, AM, SD, MM, PP, QM, PM, HR, PS, WF, IS, BS; B Includes ABAP/4, Screen Painter, Menu Painter, SAP Script, Correction/Transport, Data Dictionary, Function Modules, User-Exit Routines, SAP Installation. High mobility preferred. (Multiple positions) 40 hrs/wk; \$56,615 - \$75,000. Report/submit resume to Mgr. Washington Job Center, Millcraft Center, Ste. 150 LL, 90 West Chestnut Street, Washington, PA 15301, Web 96631.

ERGOSOFT offers custom business software development for the automotive industry and is expanding to the manufacturing and municipal markets. Due to dynamic growth, we require qualified IT professionals such as programmer analysts, systems analysts, software engineers and software consultants with experience in the following areas:

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Web Related Technology: HTML, JavaScript, VBScript, ASP, ActiveX, Java Beans, Corba, Net Object Fusion, VISUAL Café, Cold Fusion, DBC, EJB, RMI, Web Sphere, DBC, JDK, JWS, IIS

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TECHNOLOGY THAT HELPS THE HEALING PROCESS

University of Colorado Hospital currently seeks the following technical professionals for our new Fitzsimmons campus.

EUC MANAGER

Provides fiscal/strategic technical support; manages team on 24/7 schedule; oversees operations of PCs, servers in multi-location environment. Requires BS/CS or equivalent, 5+ years' technical management or related experience.

COMMUNICATIONS MANAGER

Oversees an evolving voice/data drop communication architecture; supervises Network Engineers and Project Managers; negotiates contracts. Requires BS/CS or equivalent experience; knowledge of voice, data, video communication networks for a multi-location facility. 7 years' supervisory/management experience in voice/data networking organization a plus.

We offer a competitive salary and benefits package. For consideration, you must submit an application. Applications available at University of Colorado Hospital, 5250 Leetsdale Drive, Suite 112, Denver, CO 80222. Call Eric @ (303) 372-2023 for more information or fax (303) 372-2089. Email: hr.eric@uhcolorado.edu. Jobline: (303) 372-WORK (9675). Visit our website at www.uhsc.edu/uh/human. EOE

Newbridge Networks is an international company specializing in state-of-the-art digital networking communications systems. We've been designing, developing and delivering these systems for 13 years to customers throughout the U.S. and the world.

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We have openings throughout the U.S. including: Chantilly, VA; Andover, MA; Chicago; Dallas and Houston; Miami; Philadelphia; San Ramon, Santa Clara and Sunnyvale, CA; Denver; and Bloomington, MN.

We offer competitive salaries and comprehensive benefits. Please send your resume to: Newbridge Networks Inc., HR-Resumes, Dept. CW, 15036 Conference Center Drive, Chantilly, VA 20151. Email: hrrsa@newbridge.com. Fax: 703-679-5114. EOE

NETWORK ENGINEERS

needed for network engineering, development and support for digital switching systems and wide area networks. Master's required in Electrical or Electronics Engineering or any other related field of study plus 3 years of experience. Employer will accept a Bachelor's degree plus five years of experience in lieu of the Master's and 3 previously mentioned. Must have proof of legal authority to work in the U.S.

Salary: \$70,000/year for a 40 hour work week.

Interested applicants apply to the nearest Job Service office or submit resume to: Job Service, 1105 Briggs Avenue, Durham, NC 27703. Job Order #NC3013354. Resume must include Social Security number. Ad paid by An Equal Opportunity Employer.

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Aukum, Inc. is seeking professionals such as Programmer Analysts, Software Engineers, and Software Consultants in the following areas:

Web developers with strong C + +, UNIX, Java, and scripting skills -

Creative Developer with background in XML, Java, Java Script, ASP -

Business Analysts with experience in designing and implementation of turnkey systems -

Additional skill sets sought:

LANGUAGES: Java, Servlet, JDBC, ASP, DHTML, HTML, XML, Java Script, PERL, COBOL, C, C + +, CGI Script, SQL, Visual C + +, Visual Basic

APPLICATIONS TOOLS: Broad Vision 4.0, Vignette, SAP, IDE: Visual Café, Jbuilder, ColdFusion, EditPlus, Sybase, DB2

RDBMS: Oracle, Developer 2000, Designer 2000

Operating Systems: UNIX, Windows 95/NT, OS/2, Linux

Multiple positions exist. If you are interested, please mail your resume, clearly indicating the reference number: CW6, to Attention: Recruiting Department, Job. Ref. # CW6, Aukum, Inc., 30400 Helmandale Drive, Franklin, MI 48025.

COMPUTER

Informix Software, Inc. has job opportunities in the following locations: California (Menlo Park, Los Gatos, Oakland, Sunnyvale, LA area and other locations); Colorado (Denver and other locations); Oregon (Portland); Massachusetts (Burlington, Boston, Westboro, and other locations); Georgia (Atlanta); Kansas (Lenexa); Vienna, VA; Florida (Miami, Orlando, Tampa); and in other areas across the United States: * Software Engineers (All Levels) * Software development Managers * Programmer Analysts * Systems Analysts * Technical Support Engineers * Finance Manager * Sales Engineer * PC Support Technician * E-Commerce Regional Solution Development Manager * ATG Engineer * Project Manager

Reqs: BS/MS and 0-5 years of experience.

For immediate consideration, send your resume with salary requirements to: Informix Software, Inc., Dept. ASJ049E, Professional Staffing, 4100 Bohannon Drive, Menlo Park, CA 94025; fax: (650)926-6873. E-mail: resumix@informix.com. EOE M/F/D/V. No phone calls please.

Software Engineer to research, design and develop computer software tools and applications incorporating a rule-based, inference engine driven architecture. Analyzes software requirements to determine feasibility of proposed designs within time and cost constraints; consults with hardware engineers and other staff to evaluate interface between hardware and software, and operational and performance requirements of the systems to be used. Formulates and designs software, including distributed deployment capabilities using an Application Server based approach. Development will be done using the PROGRESS Version 9 RDBMS and 4GL development systems and PROGRESS Version 9 Open AppServer products. Also directs software testing procedures, programming, and documentation and coordinates installation of the software systems. Bachelor's in Computer Science plus five yr. exp. in job offered or five yr. exp as Programmer/Analyst or Systems Analyst req. Salary: \$65,562/yr. Job site: various sites throughout the U.S. Send this ad and your resume to Job # WEB 97976, Joseph Stratico, PA Job Service, Pittsburgh/Allegheny County CareerLink, 425 Sixth Avenue, #2200, Pittsburgh, PA 15219.

Application Support Specialist needed for computer solutions provider. Assist end-users in solving application related issues. Research and establish Order Points, Transfer Cycles, Safety Stocks, EIOs and Manifests. Research PILs, Forecast Parameters and Demand Analysis, Audit Inventory Reports, including Cycle Counts, Variances and Inventory Valuations. Analyse sales and purchasing statistics, assist in RF Warehouse management and product location setup, training and implementation. 4 year undergraduate degree in computers and/or warehouse management systems, 2 years directly related experience in "real-time" environment, moderate travel required, 9:00 AM - 5:00 PM, Mon - Fri, \$52,000/yr + benefits, must be team oriented, with excellent analytical, phone and customer service skills, send resume in duplicate to: Case #19991188, PO Box #8968, Boston, MA 02114.

IT professionals with a min. of 2 yrs. industry experience in (A) or (B) or (C) or (D) or (E) or (F) or (G) urgently needed. (A): VC++, Visual J++, ATL, WiproAcer Entra 300; (B): JavaScript, DHTML, JDBC, Java 1.2 Servlets; (C): VC++, JavaScript, HP-UX, ANSI C++, MFC/ATL, Jbuilder/Jdeveloper; (D): JavaScript, Delphi, ReportSmith, Lotus Notes 4.0., PS-2-/3-tier Architecture; (E): AS/400, DB2/400, CL/400, RPG/400, IDDU, APLUS, ALDON; (F): Visual Interdev, VJ++, Interest, Clist, Pro-comm, Load Runner, Kermit; (G): HP-UX, HP 9000, Oracle Discoverer, SQL*Loader, Shell Script; (F): IMS/DB, Java SDK, JavaScript, VBScript, Connect Direct, Perl Concepts, Visual Interdev; (G): Chatturvedi OpenROAD 4GL, Jbuilder, Perl Scripts, OpenIngres, ClearCase, Sun JDK. Please send resume & salary reqmnts. to HR, Software Technical Services, Inc. 105 Nobel Court, Alpharetta, GA 30005.

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The Positions

SENIOR SOFTWARE ENGINEER

Specify, design, test, and deliver software to support products in the healthcare industry. Leverage key technologies and process improvements, execute schedules, and mitigate risk for deliverables. This position will also develop system requirements and integrate software subset into product and communicate with functional teams regarding design, risk, and recommendations.

This natural leader has a BS and either an MS or 5 years of experience in a technical discipline, strong software analysis and design methodology skills, and abilities in C/C++ methodology and JAVA programming.

SOFTWARE ENGINEER

Specify, design, test, and deliver software in support of products in the medical/healthcare industry. Leverage key technologies and process improvements.

The ideal candidate has a BS in a technical discipline along with knowledge of C/C++, assembly, and scripting. Other requirements include software analysis and design methodology skills, familiarity with software/hardware development platforms (UNIX, Solaris, Win NT), and demonstrated understanding of industry standards (Dicom).

IMAGING ARCHITECT

Develop strategic architecture for digital image compression in the next-generation PACS product line, lead "best-in-class" image quality process for new and existing imaging systems, and coordinate internal/external development and feasibility studies.

We seek a strong communicator with a BS/MS in EE and CS and five years' digital image processing/algorithm development experience. This person should be able to identify and manage problems outside the given area of technical expertise and coordinate research projects with useful results.

PACS SYSTEMS INTERFACE ENGINEER

Analyze customer requirements to develop radiology and hospital interface solutions for GE Picture, Archiving, and Communication System (PACS). Plan and schedule new network solutions through interface with cross-functional teams.

The successful applicant has a BS in Computer Science or a related engineering discipline and related project management experience. Other requirements include strong process orientation and troubleshooting skills, demonstrated success in customer service, and natural leadership ability. Experience with computer networks a must.

LEAD PROGRAM INTEGRATOR/LEAD SYSTEM DESIGNER

Lead cross-functional team in defining and executing programs. Supervise software engineers in developing software. Work with Marketing, Engineering, Service, and Manufacturing to develop roadmap for software applications.

We seek a seasoned communicator with a BSEE/CS and MSEE/CS (or related technical discipline). This person should have experience in C/C++ and Java development as well as Windows NT/databases/Web tools. Six Sigma training and software development experience also required.

MANUFACTURING PROCESS ENGINEER

Manage the manufacturing processes. Provide quick support to the production floor. Execute projects targeted at yield improvements and productivity increases.

The successful candidate should be a highly motivated cross-functional team player and possess a BS in engineering; a minimum of 3 years of experience in manufacturing or design; demonstrated project planning, organization, and execution skills; and the ability to balance multiple projects.

ON-LINE ENGINEER

Provide expert remote and/or on-site technical support to field service and customers around the globe to minimize equipment downtime while improving customer satisfaction. This position will also manage and support business processes to maximize competitiveness and quality.

This computer expert should have a BSEE or equivalent education and experience; 3 years of related experience; effective interpersonal, communication, and project leadership skills; and business acumen.

FINANCIAL ANALYST

Perform critical financial and operational analysis. Review Operational Group's Six Sigma projects and provide financial support/validation. Perform account reconciliations and ensure the accuracy of each unit's financial results.

The successful applicant has a BA/BS in business, accounting, or a related field; a minimum of 3 years of financial experience; and excellent analytical, interpersonal, communication, and problem solving skills.

BLACK BELT

Act as both a technical/cultural change agent and international consultant for quality. Manage projects to ensure the reduction of defects and/or process variation. Mentor, train, and coach Green Belts and team members.

The ideal candidate has a BS/BA or equivalent experience; strong analytical, problem solving, communication, interpersonal, and project management skills; a strong track record; and proven team leadership ability.

MANAGER, GLOBAL CT SEGMENT

Manage a global program fund to drive substantial revenue growth in new global CT market segments of cardiology, oncology, interventional, and visualization applications. Generate ideas and execute software programs. Lead program teams to execute new product development.

We are seeking an MBA, Technical Program Leadership graduate, or former corporate audit staff participant. Financial exposure to business planning or market analysis preferred.

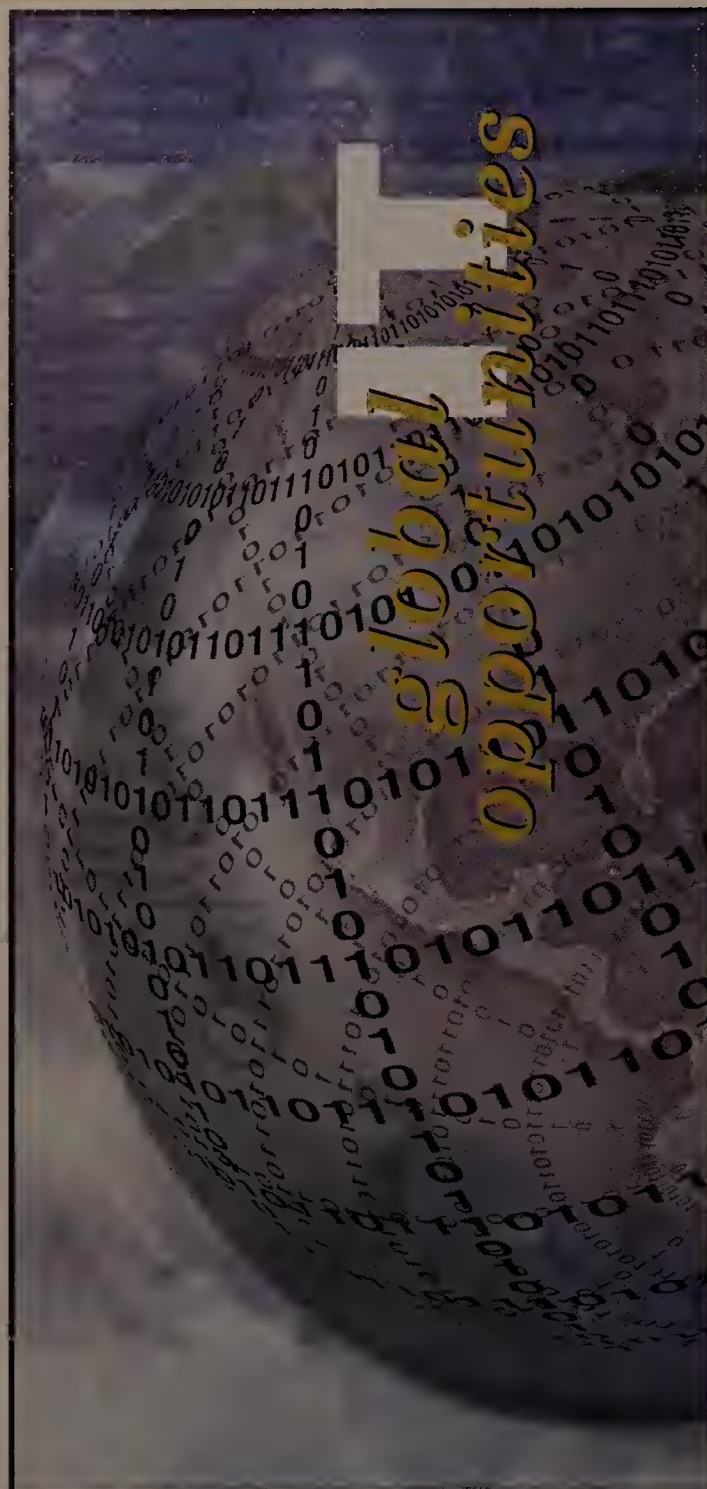
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SOFTWARE ENGINEER to design, develop, test, implement and maintain application software for financial services industry using C, C++, Visual C++, Visual Basic, HTML, XML, Java, Active-X, Active Server Pages, Perl, Oracle, Access, and SQL Server on Windows 95/98/NT operating systems. Require: M.S. degree (or equivalent) in Computer Science, an Engineering discipline, or a closely related field, with two years of experience in the job offered or as a Programmer/Analyst; A.B.S. degree with an additional five years of progressively responsible experience in the field will be considered equivalent to a M.S. degree. Extensive travel on assignments to various client sites within the U.S. is required. Salary: \$68,000/yr., 8 am to 5 pm, M-F. Send resume to: Raghavendra Kulkarni, President, Pro Softnet Corporation, 3235 Satellite Blvd., Bldg. 400, Suite 300, Duluth, GA 30096; Attn: Job MK.

Are you looking for a challenge utilizing the newest innovative technology? Look no further. Fairfield Residential, a rapidly expanding national management company located in San Diego, CA, is seeking a Sr. SQL Database Administrator/Developer to give oversight to corporate databases, including logical and physical design, data modeling, normalization and application development. Coordinates database utilization between departments. Works with Timberline Report Writer to extract data for data-based reports. Uses ODBC and SQL to connect various data sources. Supervises staff and help desk to coordinate and plan database strategies. Must have a BA/BS degree or the equivalent experience, plus a minimum of 3 years specialized training with SQL server and DBA. Must be familiar with NT operating system and website database connections. Interested candidates, please submit resume via e-mail to petherton@ffres.com or fax to 858-457-5369.

SR. SOFTWARE ENGINEER (Marlboro, MA). Design, develop, implement & maintain code for enterprise, database & network mgmt software products utilizing C/C++, JAVA & SQL under UNIX platforms. Develop concepts & techniques for coding & designing system software. Conduct code & design walkthroughs, review the work of other engineers & monitor system test projects. Use debuggers & knowledge of C/C++ to diagnose & fix product defects & document & explain usability issues to clients utilizing client server technology. Req's: Master's in Comp Sci, Math or Eng. & 1 yr exp as Applications Programmer, Software Eng, or Systems Analyst. The 1 yr exp must include working with C/C++, JAVA, SOL, UNIX & client server technology. 40 hrs/wk; M-F; 9:00-5:00; \$72,500/yr. Send resume to Case # 19992456, PO Box # 8968, Boston, MA 02114.

PROJECT MANAGER to supervise the technical development and implementation of management information systems for various applications using CORBA, JAVA, C/C++, PERL, Java Script, HTML, DHTML, UML, SQL, Oracle, SQL Server, DB2, MS Access, ORBIX, Visual Interdev and MS IIS under UNIX and Windows operating systems; Ensure that goals and objectives of projects are accomplished within prescribed time frame and funding parameters; Establish work plan and staffing for each phase of project; Confer with project staff to outline workplan and to assign duties, responsibilities, and scope of authority; Prepare project reports for upper management and clients; Confer with project personnel to provide technical advice and to resolve problems. Require: B.S. degree in Computer Science, an Engineering discipline, or a closely related field with five years of progressively responsible experience in the job offered or as a Systems Analyst/Software Engineer. Extensive travel on assignment to various client sites within the U.S. is required. Salary: \$70,000 per year, 8:00 am to 5:00 pm, M-F. Send resume to: Eduardo Santos, President, Custom Software Solutions, Inc., 4025 Leeamur Court, Lilburn, GA 30047. Attn: Job VS.

SOFTWARE ENGINEER
DUTIES: Develop software for 3D graphical, mechanical computer-aided manufacturing software using C++ and C programming languages; Develop creative solutions for moderately complex manufacturing problems based on schedules prepared by supervisor; Deal with software development issues including computer graphics, graphical user interface development, object oriented software, and commercial software; Maintain and build software releases.
REQUIRED EXPERIENCE: Applicant must have a Bachelors of Science in Computer Science and one year programming experience with Microsoft Foundation Classes & C/C++ language; Knowledge of 3D computer graphics; Knowledge of advanced linear algebra and mechanical file formats; Skills in scientific programming. Hours from 8:00 a.m. 5:00 p.m. Wage \$52,660 per year.
Send resume to: DEPARTMENT OF WORKFORCE SERVICES
Attn: Pat Redington Job Order #3061016, 140 East 300 South - 1st Floor, Salt Lake City, Utah 84111.

Computer Systems Analyst: analyze user needs, procedures, problems; identify solutions, improve existing systems; write detailed description of needs, program functions, steps for dev./modif. of software; review existing system re: possible change, eval. effectiveness, dev. new systems for improved prod./workflow; prep detailed workflow charts, diagrams, tech. reports, manuals; upgrade/maintain systems, correct errors. Must have BS/comp. sci. or electronic engr. +2 yrs. exp./this job or software engr. \$62,000/yr. Job-site/intervw: Denver; may be temporarily assigned to other sites-employer pays expenses. Application by resume only; send this ad & resume to: Colorado Department of Labor and Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117, and refer to order number CO4660143.

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Human Resources Reps
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SOFTWARE ENGINEER to design, develop, and implement application software in client/server environment using C, C++, Java, HTML, CGI, SOL, Roguewave, Shell Scripts, Informix, and Oracle under UNIX operating systems; Perform object oriented analysis and design using Rational Rose and Together/J CASE tools; Perform logical and physical data modeling using PowerDesigner CASE tools; Develop object-oriented interfaces to RDBMS; Perform database tuning, optimization and development for Oracle and Informix databases. Require: Master's degree in Computer Science, an Engineering discipline, or a closely related field, with two years of experience in the job offered or as Systems Analyst or Systems Engineer; Extensive travel on assignment to various client sites within the U.S. is required. Salary: \$73,000 per year, 8 am to 5 pm, M-F. Send resume to: Caryl James, HR Manager, IDAPTA, Inc., 817 West Peachtree St., Suite 750, Atlanta, GA 30308; Attn: Job AP

Preempt, LLC, a Minneapolis corporation needs the services of a Business Analyst to carry out project planning, costing analysis & develop fin. Mgmt. Info. Sys using J.D. Edwards' OneWorld Dev. & Tech Tools. Parallel Port Applications on IBM AS/400 & J.D. Edwards Vb73.3.2, JDE World, JBA & ILE RPG, RPG/400, CL/400. Min. 2yrs. exp. Salary \$50,000/yr with benefits. Fax resume to (612)-829-1240 or e-mail to deb@preempt.com

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Software Engineer. Design, develop, analyze, implement, test and maintain client server, Oracle, Internet, and ERP applications. Demonstrated ability working with Oracle and ERP applications such as GL, AP, AR, OE. Demonstrated ability working with programming languages such as C, C++, SQL, Developer 2000 (Forms & Reports). Demonstrated ability working with Internet applications using tools such as Java, CGI, Perl, HTML on multiple platforms such as Unix and Windows. \$64,161/yr. 40 hr/wk. 9 a.m. - 5 p.m. Must have 5 yrs. exp. and B.S. Comp. Sci., Eng. rel. field/equiv. Send 2 copies of resume: Job Order #2000-256, P.O. Box 989, Concord, NH 03302-0989.

Programmer/Analyst. Design, develop, implement and administer Sybase relational database client/server applications. Design, develop, implement and administer systems. Write interfacing programs using Unix, C, Shell scripting. Develop modules in C programs and Sybase stored procedures. Demonstrated ability designing, developing and implementing systems using Sybase and PowerBuilder. Demonstrated ability working with shell scripting, C language and Unix to write interfacing programs. Demonstrated ability working with Unix and TCP/IP protocols. \$65,000/yr. 40 hr/wk. 9 a.m. - 5 p.m. Must have 1 yr. exp. and B.S. in Comp. Sci., Eng., rel. field/equiv. Send 2 resumes: Case #19992500, P.O. Box 8968, Boston, MA 02114.

Sterlite Software USA, Inc., needs Software/Systems Engineers, Systems/Programmer/Business Analysts with a min. of 2 yrs. Exp. in either (A) or (B) or (C) or (D). (A): Unix Internals, Unix Dec Alpha Server, Oracle Reports 3.0, Matrix, SQL*PLUS, SQL*Functions, SQL*Loader; (B): HP-UX, AIX, Discover: 3.1, SQL Navigator, PVCS, VSS, Appworx, Oracle Financials 10.7 SC; (C): PFC, Cornerstone, Smartstream, Web Powerbuilder, MS-COBOL, T-SQL, Watcom SQL, SQA Manager, SQL Navigator Pro; (D): Windows-NT, SCO UNIX 5.0.4, Visual Basic 6.0, ActiveX, COM/DCOM, ODBC, DAO, RDO, ADO. Travel reqd. Please send resume & salary reqmnts. to HR, 111 South #2, Princeton Arms, Cranbury, NJ 08512.



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Database Software Developer

• Design, develop and integrate database solutions into our complex software solutions. Successful candidates will have: • 3-5 years experience designing and developing database solutions • Oracle, MS SQL Server or Sybase • C, C++ or Visual Basic • Integration of database with Web services • Proven ability to excel in a team-oriented project environment.

Software Testers

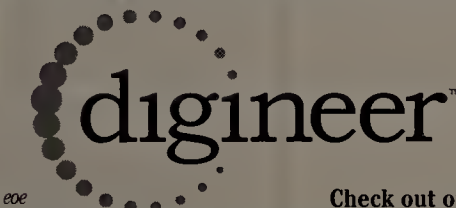
• Ensure that our software solutions meet the high standards we demand in order to satisfy our clients' needs through the design and testing of the software. Successful candidates will have: • A passion for testing software applications for the Windows® platform • Knowledge of testing processes (including planning, unit and integration testing) • Demonstrated ability to write test case scenarios and test plans.

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• Facilitate the software development process, balancing customer needs with technical and design feasibility and managing relationships with our customers. Successful candidates will have: • 5-10 years of successful project management in the software industry • Integration of legacy applications with new client/server development • Successful experience managing complex software development projects.

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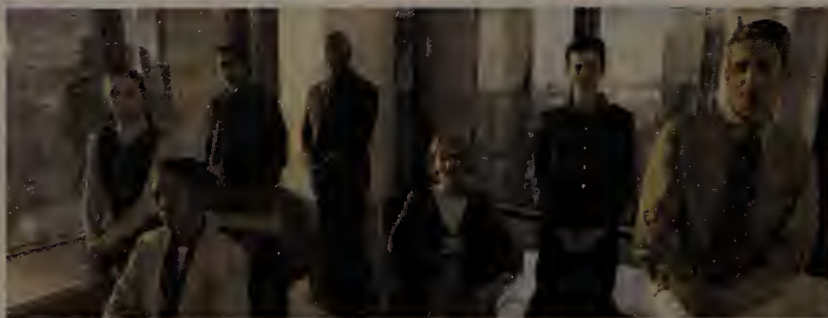
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For immediate consideration, please e-mail resume as a Word 97 attachment to Jim.Lang@Equitable.com, or fax resume to: (212) 314-5290. All responses must include salary requirements. EOE M/F/D/V



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Provide services to clients to design & dev. of business systems to support company activities & data files, study user requirements, conduct systems analysis, design, coding, testing, implementation & reengineering of datamanagement modules, working with Unix, VAX, SUN SPARC 20/Ultra, SPARC1000/2000 workstations, Solaris, C, & RCS (revision Control System). \$75,000/Yr. 40 hrs/wk. Bachelor or equiv. in computer Sc., Computer Eng., Math or Engineering & 2 Yrs. exp in job offered or 2 Yrs. related exp. as Sr. Systems analyst or Systems Consultant, to include use of noted skills in job duties. Will work at anticipated locations in the U.S.

Send 2 resumes or apply to the GA Dept. of Labor, Job Order #GA 6502575, 2943 N. Druid Hills Rd., Atlanta, GA 30329 or the nearest Dept. of Labor Field Service Office.

SVI America Corp. is an information management & technology consultancy organization with offices throughout the US. We work with many organizations to develop integrated solutions that transform their enterprise. By understanding the key components that drive an organization, we are providing tangible results and a competitive advantage to our clients. SVI presently requires a Program Manager with the following qualifications: BS in CompSci, Math, Statistics, or Eng'g, four years related experience that includes a background in management, as well as experience in mainframe and client-server technologies, COBOL, CICS, DB2, DL/I, VSAM, UNIX & Informix. Must be willing to relocate temporarily to client sites throughout the US. To apply, please contact: HR Department, SVI America Corp., 6201 Fairview Road, Suite 200, Charlotte, NC 28210 or FAX-704-553-8179 (Please indicate position for which you are applying.)

MBNA Hallmark Information Services, a subsidiary of a major national bank, is actively interviewing for a limited number of openings in its Distributed Operations department in Newark, Delaware.

SENIOR TECHNOLOGY ENGINEER

Must have Master's degree in computer science, math, engineering, or related discipline and four years of experience as a Senior Technology Engineer or in a software system development occupation. Must have experience with UNIX and NT systems, C++, Visual BASIC, Oracle, Sybase, CMVC, Informix, and Powerbuilder. Competitive salary and benefits package offered. Send resume, referencing code No. N06301576E, to MBNA 1100 N. King St., Wilmington, DE 19884-3638.

Systems Engineer (Temple Terrace, FL). Analyze user requirements such as new or changed business requirements and provide conceptual solutions to satisfy them. Determines impact of proposed changes on system architecture during requirements definition phase and provides technical solutions to meet them within schedule. Design, analyze, estimate and implement service requests. Identify, recommend and document effective design methodologies and tools to be utilized during the design code test implementation, and installation phases using Visual Basic, MS SQL Server, Oracle, MS Access and Crystal Reports. Reqts: Bachelor's degree in Computer Science, Engineering or Math. Two yrs exp in the job offered or two yrs as a Systems Analyst. Two years of exp must include exp with programming with Visual Basic, M.S. Access and Oracle. 40 hrs per week. 8:30-5:00. \$51,600 per year. Send resume to Dept. of Labor/Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, FL 32302-0869. Re: JOFL# 2076999.

Member Technical Staff (Temple Terrace, FL) Responsible for developing technical solutions based on directed research and investigations to solve complex architectural and design issues related to design and deployment of GTE Intelligent Network. Research, organize and prepare the architectural designs and standards, and tactical telecommunications business activities. Develop the definition of the target architecture using Multi-tier client/server, internetworking, OLTP/OLAP. Create high-level migration plans based on the newly developed architectural framework using transaction engines. Review tactical and project level technical implementation plans to ensure conformance to the target architecture. Reqts: Master's degree or equivalent in Computer Science, Math or Computer Engineering. Equivalent means the employer will accept Bachelor's degree plus five years progressive experience as the equivalent of a Master's degree plus two. Two years experience in the job offered or two years experience as a Software Engineer. Two years of experience must include experience developing Multi-tier client/server solutions and internetworking OLTP/OLAP, & C/C++. 40 hours per week. 8:00am-5:00pm. \$82,000 per year. Send resume to Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, FL 32302-0869. RE: JOFL-2081329

Programmer Analyst. \$63K/yr, 8a-5p, 40 hr/wk. Plan, dvlp, test & implt comp prgm using prgm techniques/analysis of systems & to review/alter prgms to automate & enhance operating capacity & adapt to new reqmts using VB 4(16-bit), Access 2.0, Crystal Reports, Sybase System 11, Foxpro, Unix, Unix Intervals, C, C++. Must have Bach or equiv w/major in Comp Sci or Engg or Technology. Exp reqmt: 18 mos work exp in job offd or in related occupation as Systems/Prgrmr Analyst or Associate. The req'd 18 mos work exp in job offd or in related job must use prgm & s/ware applies using VB 4(16 bit), Access 2.0, Crystal Reports, Sybase System 11, Foxpro, Unix, Unix Intervals, C, C++. Job loc: Lawrenceville, GA. Send 2 resumes or apply in person at: GWINNETT, JO # GA6511836, 1535 Atkinson Rd., Lawrenceville, GA 30043-5601 or the nearest Dept of Labor Field Svc Office. Must have proof of legal auth to work in US.

SR. SAP PROGRAMMER ANALYST

W.R. Grace & Co. is seeking a Senior SAP Programmer Analyst at its facilities in Cambridge, MA, to analyze, design and develop SAP R/3 ABAP/4 programs. Required to write SAP R/3 ABAP/4 programs from detailed specifications and designs, and develop and maintain Layout Sets (forms and SAPScripts). Perform research using SAP's Data Dictionary information systems. Apply and search application solutions using SAP's On-line Service System (OSS). Salary commensurate with experience. When applying for this position, please forward resume to W.R. Grace & Co., Attn: Tim McKeown, Manager, Comp & Expat. Management, 7500 Grace Drive, Columbia, Maryland 21044.

PROGRAMMER ANALYST. Analyze existing procedures and systems; convert to new systems; perform code, debugging and prepare documentation of developed modules; testing of modules; implement and input operational training to users on the developed modules. Salary: \$60,000 per year. Working hours: 40 hours per week, 8am-5pm. Min. required: Bachelor of Science or equiv. in a computer related field. Also required: college level course work or one year experience in ORACLE in UNIX environment, writing shell scripts such as BORNE SHELL, C SHELL, KROME and utilities like SED and AWK, Visual Basic, PowerBuilder, Oracle, SQL, PL/SQL, C Designer 2000, Developer 2000 and SQL Loader. Send two resumes to Gwinnet, Job Order #GA 6511091, 1535 Atkinson Rd, Lawrenceville GA 30043-5601 or nearest Dept. of Labor Field Service Office.

Principal Software Engineer / Project Leader: Responsible for research into year 2000 problems on various software systems, and providing appropriate solutions. Research will consist of finding Y2K problems existing in the systems software and possible programming errors related to particular programming languages or environments, and developing general-purpose solutions. Also will organize and manage software professionals in the execution of identification and remediation projects. Will perform identification and remediation in complex problems on projects. Requires: Ph.D. in C.S., E.E. or related field. Also requires knowledge of C/C++. FORTRAN, and RDBMS including Oracle and Sybase and the X Window system. 40 hrs/wk (9 to 5); \$85,000/yr. Send two resumes/response to Case #19990923, Box 8968, Boston, MA 02114.

MBNA Hallmark Information Services, a subsidiary of a major national bank, is actively interviewing for a limited number of openings in its Distributed Operations department in Newark, Delaware.

SENIOR SOFTWARE ENGINEER

Must have a bachelor's degree in Computer Science, Math, Engineering, or related discipline and three years of experience as a Senior Software Engineer or in a software development occupation. Must have experience with Windows NT, SYBASE, SQL, Unix, C++, CMVC, XIPC, RDBMS, and Tuxedo.

Competitive salary and benefits package offered. Send resume, referencing code No. N63015706, to MBNA 1100 N. King St., Wilmington, DE 19884-3638.

ENGINEERING PROGRAMMER in Jacksonville, FL. Apply engineering background to convert engineering & other tech. problem formulations to a computer processable format. Apply extensive knowledge of comp sci & engineering to direct analyst-programmers in resolving problems of intent, inaccuracy, or feasibility of comp processing through analysis of user reqs, operational procedures, production & workflow needs. Direct analyst-programmers in the installation, implementation & modification of hardware & software. Must be willing to travel to client sites for assignments which vary in duration from several days to several yrs. Bachelor's degree in Comp Sci or equiv. 4 yrs exp in the job offered or as Software Engineer. 40 hrs/wk, 9a-5p, \$75,000/yr sal. Verif refs. Send resume to Workforce Program Support, PO Box 10869, Tallahassee, FL 32302-0869, JOFL#2079761.

Senior Software Engineer (Temple Terrace, FL) Design, research and develop telecommunications network management software systems using HP, UX, C/C++, knowledge of Telecommunication Network Management, CMIP-base telecommunication tool kit and object oriented database. Reqts: Master's degree in Computer Science, Information Technology of Engineering. Two years experience in job offered or two years as a Systems or Software Engineer. Two years experience must include experience with software development using HP UX, Operating Systems, C/C++, Telecommunications Network Management and object-oriented database. 40 hours per week. 8:30-5:00. \$68,000 per year. Send resume to Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, Florida 32302-0869. FLJO# 2083485.

Software Engineer, Malden, MA; Analyze, design, develop, test and implement the Financial/Database applications using Visual Basic, Oracle, MS Access, Crystal Reports and Magic on Windows and Unix environment. Use PVCS and SourceSafe to maintain Source Code Control Systems. Req'd. Masters* in Engg. or Comp. Scie. or Math. 1 *yr .Exp. in job offered or 1 yr. exp. in a Related Computer Profession. * Will accept Bachelors degree and 5 years of progressive work experience in lieu of masters and 1 yr. exp. 40 hrs/wk., 9a-6p., Mon-Fri., \$76,252.80/Year. Applicants should submit two (2) copies of resume in response to Case #19990932, P.O. Box 8968, Boston, MA 02114.

Full time Sr. Programmer Analyst to perform end user requirements study, systems analysis, systems design, coding, implementation documentation and maintenance support as required by the end user. Perform systems analysis and design support on application software using Developer 2000 on Client/Server Oracle based system. Design, develop, test and implement test software using Oracle. Must have a bachelor's degree in CS, any engineering discipline or related field (foreign degree equivalent accepted). Must have two years of experience in job offered or position with the same duties. Salary \$65,000. Send resume to: DataScan Technologies, 1105 Sanctuary Parkway, Suite 190, Alpharetta, Georgia 30004, Attn: Kimberly.

NYFIX, Inc, a Stamford, CT based developer of electronic trading systems, seeks Software Engineers w/strong C++ & SQL. MS in Comp Sci, Tech, Engg, Math or related field & min 2 yrs related exp.

Mail / Fax / Email resume to NYFIX, Inc, HR, 333 Ludlow St, Stamford, CT 06902. Fax: 203-425-8100, Email: jobs@nyfix.com

Systems Analyst wanted by IS/IT Consulting Services Co. in Woodbridge, NJ for client locs throughout US. Must have Bach in Comp Sc, Engg & 2 yrs s/ ware exp.

Respond to: HR Dept., AVS Systems, Inc., 40 Enterprise Ave, Secaucus, NJ 07094. (Ref. #GG-6145)



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The aforementioned positions are available at all levels and require a minimum of a BS or MS and 0-5 years industry experience.

- Optical Engineer/Scientist with experience in Optical, IP, ATM, SONET, network architecture and design. Ph.D. required.

For all positions, send resumes to: Staffing, Sycamore Networks, 10 Elizabeth Drive, Chelmsford, MA 01824, Fax: (978) 256-6594, or e-mail: resume@sycamorenet.com

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Software Engineer-Deerfield Beach, FL. 40hr/wk, 9a-6p, \$56,909/yr. Position reqs Bach in Engg or major field of study instrumentation & control & 4 yr exp in job offd. Duties incl research, dsgn & dvlp comp s/ware systm in conjunction with h/ware product dvlpmt for medical, industrial appics; applying principles & techniques of comp sci, engg & math'l analysis. Interact w/client reg s/ware reqmts to determine feasibility of dsgn w/in time & cost restraints; consult w/hardware engrs & other engg staff to eval interface b/w hardware & s/ware, & operational & performance reqmts of overall systm; formulating & dsgn s/ware systm using scientific analysis & math'l models to predict & measure outcome & consequence of dsgng; dvlpg & directing s/ware systm testing procedures, prgmng & documentation; consulting w/ customers re: maintenance of s/ware systm; may coord installation of s/ware systm. Must have knowl of following comp langs & pckges; VB 5.0, C++, SOL, Pro*C, Win 98, Win 95, Win NT, Win 3.11, DEX-UNIX, DOS, Oracle 7.0, 6.0, MS-Schedule+, SDK, MS-Office, Forms 4.5, Fox Pro 2.5, PowerBuilder, Reporter Writer 2.5, VMS, Ultrix, Novel Netware 3.1X. Send resume to Dept of Labor/Workforce Prgm Support, P.O. Box 10869, Tallahassee, FL 32302, Attn: EH, RE: JOFL#2063347.

Systems Analyst wanted by Info Tech Firm in Union, NJ. Must have degree in Comp Sci or equivalent interpreting COBOL Statements & rewrite in ORACLE & UNIX.

Respond to: HR Dept, Patel Consultants Corp, 1525 Morris Ave, Union, NJ 07083.

Programmer Analyst, Malden MA; Analyze, design, develop, test document and implement applications using Oracle Back-end, Designer 2000, SOR Reporting Tool and SQL*PLUS. Provide technical support. Req'd. Bachelors in Engg. or Comp.Sci. or Math. 2 yrs. exp. in job offered or 2 yrs. exp. in Computer Related profession. 40 hrs/wk., 9a-6p, Mon-Fri., \$70,000/Yr. Applicants should submit two (2) copies of his/her resume in response to: #19992562, P. O. Box 8968, Boston, MA 02114.

Software Engineer sought by Princeton, NJ Co. involved in Computer modeling of biological systems. Must have Masters in Biomed or Elec Engg, Comp Sci, Applied Math, Num Analysis & 1 yr exp dsngng, dvlpng, integrating, testing & debugging computer-based physiological systems analysis s/ware, using C++, Java & HTML.

Respond to: HR Dept., Physiome Sciences, Inc., 307 College Rd East, Princeton, NJ 08540-6608.

3D Animation Software Developer wanted by New York-based Maritime Education & Services Co. for job in New York City. Must have Masters in Comp Sci or Engg & 2 yrs related experience. Respond to: Brian Donohue, Director of R&D, The Seamen's Church Institute, 241 Water St, NY, NY 10038

Software Developer wanted by Tech Solutions Co in Norwood, MA. Must have BS in Electrical Engg & 1 yr s/ware exp.

Respond to: HR Dept, Manoj Saxena, ADZAP, Inc., 210 Neponset St, Norwood, MA 02062.

Data Base Administrator needed by Computer S/ware Consulting & Dvlpmt Co. in Paramus, NJ for client locs throughout US. Must have Masters in Comp Sc, Engg & 2 yrs s/ware exp. Respond to: HR Dept., Indus Consultancy Services, 140 E. Ridgewood Ave, Paramus, NJ 07852.

Systems Engineer, Malden MA; Analyze, design and develop Smart Client/Thin Client Oracle Applications/Web Applications (ERP Software) using Designer/2000, AIMS, PL/SQL, SQL*Plus, Discoverer, SMARTDB and SQL*Loader for migration and conversion. Req'd. Masters * in Engg. or Comp.Sci. or Math. 1 *yr. exp in job offered. * Will accept Bachelors degree & 5 yrs. of progressive work exp. in lieu of Masters and 1 yr exp. 40 hrs/wk., 9a-6p, Mon-Fri., \$76,252/Yr. Applicants should submit two (2) copies of his/her resume in response to: Case #19992451, P.O. Box 8968, Boston, MA 02114.

Systems Analyst/Programmer wanted by Securities Firm & Discount Brokerage House in Jersey City, NJ. Must have Masters in Comp Sci, Math, Finance or Engg & 1 yr exp planning, dvlpng, analyzing & testing comp applics & prgms using UNIX, C++, Perl and Visual Basic. Respond by resume to: HR Dept., National Discount Brokers Group, Inc., 10 Exchange Place, 15th Flr, Jersey City, NJ 07302.

Network Engineer, Boston, MA; Implement and manage a Windows NT network in a Trading environment with a full suite of BackOffice Server Software, which includes Exchange, SMS and SQL Server. Manage the Wide Area Network and provide support in the UNIX environment. Req'd. Bachelors in Engg. or Comp. Sci. or Math. 2 yrs exp in job offered. 40 hrs/wk, 9am-6pm. Mon-Fri. \$85,000/Yr. Applicants should submit two (2) copies of his/her resume in response to: Case #19992439, P.O. Box 8968, Boston, MA 02114.

Senior Software Engineer wanted by On-line CD & Video Sales Co in Ft. Washington, PA. Must have BS or equiv in Comp Sci, Engg, Electronics, Physics or related field & 2 yrs exp dsngng, dvlpng new server & database technologies to support on-line retail operations. Respond to: Cheryl Jacobs, HR Manager, CDNNow, Inc., 1005 Virginia Drive, Ft. Washington, PA 19034.

Computer System Engineer wanted by Pharmaceutical Co in Edison, NJ. Must have Bach in Comp Engg & 2 yrs engg exp dsngng RAS system, managing Oracle Database in SUN Solaris, maintenance & support for UNIX & NT systems.

Fax resumes to: 212-308-5325.

Software Engineer
Design, develop and implement application systems in Windows environment. Develop software systems using Powerbuilder, Visual Basic, Sybase, Oracle, on LAN's under MS-Windows operating system. Design and implement software using C, C++, and analyze and determine user requirements. B.S. (comp sci, eng. rel field/equiv) and 5 yrs. exp. 40 hrs/wk. Send resume to: Human Resources, 128 Software, Inc., 44 Wood Avenue, Suite 1, Mansfield, MA 02048.

Database Administrator, Boston, MA: Perform data modelling, provide support for Oracle Database to insure availability, performance and data integrity. Manage new database tables. Develop applications using Visual Basic, MS Access, C on Windows, DOS and Windows NT. Req'd. Bachelors in Comp. Sci or Engg. or Math. 1 yr exp. in job offered or 1 yr. exp in Computer Related Profession. 40 hrs/wk., 9a-6p. \$43,000/Yr. Applicants should submit two (2) copies of his/her resume in response to: #19992445, P. O. Box 8968, Boston, MA 02114.

Programmer Analyst: Atlanta (GA); Design, develop & test applications in finance and accounting areas in client server environment using Sybase, PowerBuilder, C and C++ on UNIX and Windows platforms; Requires BS in Computer Sc/ Elec Engg. & 2 yrs exp in Sybase and PowerBuilder using C and C++ under UNIX and Windows platforms; Salary \$60K/yr; 40hrs/wk (Mon-Fri) 8am-5pm; Apply in person or send two resumes to: Georgia Department of Labor, Job Order # GA 6513362, 2543 N. Craig Hill Road, Atlanta, GA 30329, or the nearest Department of Labor Field Service Office. Must have proof of legal authority to work in the U.S.

Systems Analyst sought by Software Consulting Co. in Iselin, NJ for client locs throughout US. Must have Bach in Comp Sc, Engg & 1 1/2 yrs s/ware exp.

Respond to: HR Dept., MJ Technologies of New Jersey, 762 Green St, Ste #2C, Iselin, NJ 08830. Ref. # GG 6623IM

Full time Systems Engineer responsible for analyzing software requirements for the company and the company's clients, using C/C++, Delphi, TCP/IP, systems software and user software specification-writing and coding. Must have a Master's degree in Electronics Engineering or foreign degree equivalent accepted. Must have 2 years of experience in the job offered or a position with same duties. Salary: \$77,430.00. Send resumes to: Karla Del Rio at Marconi Online Inc., 120 Interstate North Parkway, Suite 118, Atlanta, Georgia 30339.

Several positions available, including Software Engineers and Sr. Software Engineers in a variety of areas. Requirements and salary vary per position. Send resume to: Nanda Chheda, American Megatrends, Inc., 6145F Northbelt Parkway, Norcross, Georgia 30071.

Coats NA seeks Programmer/Analysts, Developers and DBAs to support Client/Server applications. B.Sc. Computer Sc. or related + exp. with WinNT and Oracle tools & applications required. Send resumes to Coats North American, 4135 So. Stream Blvd., Charlotte, NC 28217.

Coats is an EEO employer.

PROJECT DIRECTOR
Stoneham, MA: Project Director with proven track record in remote management of teams & projects. Design & implement web-based applications using VB, VC++, MTS, ATL, COM/DCOM, IIS, ASP in Win/NT environment. Candidates with Masters degree in tech related field & min 2 years industry experience in Proj Mgmt or DB Admn preferred. Fax resume with salary history to 781-438-7730 or email michelene@planetsoft.com

Programmer/Analyst wanted by Computer Services Co in Edison, NJ. Must have Bach in Comp Sci, Comp Engg or Elec Engg & 1 yr exp planning, dvlpng & testing & documenting comp s/ware under client server architecture using C/C++, SQL & PL/SQL with ORACLE & MS SQL Server databases in Win & UNIX envrmt. Respond to: HR Dept, Information Technology Management, 900 C Oak Tree Rd, Edison, NJ 07080.

Software Engineer

We are seeking 5 qualified candidates to develop state-of-the-art financial trading systems for institutional investors. Utilize knowledge of PERL, UNIX, & Oracle, in improving software by modifying existing features or adding new ones to enhance efficiency. Design, dvlp & implement based-financial systems supplying leading edge tools for real-time data, stocks & options analysis, charting, portfolio analysis & trading operations. Req'd: Bach. degree in Comp. Sci., Engngng or Math & 3 yrs of exp. in related field. Pls mail resume to IT Web, 410 Eighth St., 3rd fl., Hoboken, NJ 07030 or fax to 503 905 0277 Attn: Mr. Hesh. No calls, please.

Systems Analyst wanted by Co dvlpng & mktg banking s/ware in Miami, FL. Must have 4 yrs exp.

Send resumes to: HR Dept, Datapro, Inc., 1300 Brickell Bay Dr, Miami, FL 33131.

Multiple openings available! - Intervolve Inc. is looking for candidates possessing MS/BS or equivalent and relevant experience. Work with several of the following in web application development: Visual Basic, ASP, SQL Server, and MTS. Experience with Solaris, Linux, PHP/Perl preferred. Please e-mail responses to hr@intervolve.com

Software Engineer - design, development and deployment of e-business systems over the internet, using OOPs technology, Java applications, and RDBMS databases (SQL Server/Oracle). BS/MS with relevant experience. Send resume to: ShareMax.com, HR Dept, 1259 Rt. 46 East, Parsippany, NJ 07054.

Database Administrator, Stoneham, MA; Analyze, design and develop applications on Unix and Windows NT Operating System using Oracle RDBMS, Pro*C, Cobol, Clipper and FoxPro. Perform Novell Network and Oracle database administration tasks. Req'd. Masters* in Comp.Sci. or Math or Engg. 1 yr. exp in job offered or 1 yr exp. as Oracle Developer. *Will accept Bachelors degree & 5 yrs. exp. in lieu of Masters. 40 hrs/wk., 9a-6p, Mon-Fri., \$60,000/Yr. Applicants should submit two (2) copies of his/her resume in response to: # 19992510, P. O. Box 8968, Boston, MA 02114.

SOFTWARE ENG Design, develop & implement new computer processes & procedures to enhance revenue collection process (systems mods, enhancements, mgmt reporting). B.S. Computer Science or equiv + 2 yrs exp as Programmer/Analyst or Software Eng reqd. Exp w/ FOXPro, C, SQL, UNIX, MS Access, Excel & Word also reqd. \$78K/yr. Send resume to: H.R. Mgr., Premiere Technologies, Inc., 3399 Peachtree Rd, N.E., Ste 600, Atlanta, GA 30026, Ref #ED1.

Sr. Programmer Analyst - Develop migration strategy for software projects using Progress & shell scripts on UNIX based hardware. Reqs: 2 years 6 months experience. Employer is a computer consulting company. Relocation required to client sites for assignments from 6 months to 2 years. M-F, 9AM - 5PM, 35 hrs./wk., \$82,000/yr. Send 2 resumes to: Case #19992465, PO Box 89688, Boston, MA 02114.

Database Administrator, Malden, MA: Perform, install, upgrade and maintain Oracle Databases, Oracle Applications and tools Developer 2000, Designer 2000 and OEM on UNIX and Windows NT. Prepare Oracle Database Tuning, Performance Monitoring, Back up and applications tuning. Provide technical support in Oracle Financials and Oracle manufacturing Modules; use Forms 4.5 and Reports. Req'd. Masters in Comp. Sci. or Engg. or Math. 1 yr. exp. in job offered 40 hrs/wk., 9a-6p. \$75,000.00/Yr. Applicants should submit two (2) copies of resume in response to: Case #19992496, PO Box 8968, Boston, MA 02114.

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Senior Software Engineer -

East Haven, CT. Require experience in design and development of commercial software using Visual Basic and SQL Server. Attractive compensation package. Send resume to: Karan Myers, Professional Pensions Inc. 444 Foxon Road, East Haven, CT. 06513.

Programmer Analyst - design and implement web pages, server side scripting, using OOPs technology, Java applications and RDBMS database (SQL Server/Oracle). BS with relevant experience. Send resume to: ShareMax.com, HR Dept., 1259 Rt. 46 East, Parsippany, NJ 07054.

Sr. Engineer - Network Operations Center wanted by Telecom Services Co in Hackensack, NJ. Must have BS in Comp Sci, Electronics or Engg, 3 yrs. exp. utilizing WAN equipment and processes & 1 yr exp with OSPF, BGP, IS-IS and Internet routing protocols.

Respond to: HR Dept, Net2Phone, Inc., 171 Main St, Hackensack, NJ 07601.

Programmer/Analyst wanted by Computer Services Co. in Rochelle Pk, NJ. Must have Bach in Comp Sci, Comp Engg or Elec. Engg & 1 yr exp planning, dvlpng, testing & documenting computer s/ware for ERP applic using BPCS s/ware.

Respond by resume to: HR Dept, JGI, 201 West Passaic St, Rochelle Pk, NJ 07662.

Software Engineer, Malden, MA: Analyze, design and develop client-server applications using SYBASE, DB-Lib/C, ISQL, SQR and SYB-Perl on HP-UX. Provide technical support. Req'd. Masters in Comp. Sci. or Engg. or Math. 1 yr. exp. In job offered. 40 hrs/wk., 9a-6p. \$76,252.80.00/Yr. Applicants should submit two (2) copies of resume in response to: Case #19992440, PO Box 8968, Boston, MA 02114.

Software Engineer wanted by Software Consulting Co. in Princeton, NJ to analyze, design, develop, test and implement internet/intranet applications using C++, Visual C++, COM/DCOM. ActiveX, ASP and JAVA. MS in Comp Sci or Engg reqd. Only experienced candidates need apply. Respond by resume: HR Dept, Ref #2001, Princetec Inc, 4365 Route 1S, Princeton, NJ 08540.

Professional Services Consultant sought by Massachusetts-based S/ware Dvlpmt & Consulting Co. for job in New York City. Must have Bach in Comp Sci, Comp Engg or related field & 1 yr IT consulting experience.

Respond to: HR Dept, Job Code #5620, Cognos Corporation, 67 South Bedford St, Burlington, MA 01803.

SENIOR SOFTWARE ENGINEER

with 2 years of computer-related experience to design, develop and implement software applications using Oracle, Developer 2000, SQL, and Unix. Excellent communications skills and a Master's degree or equivalent required. FAX resume to HR 7819374976 or email: tbetti@raymondkarsan.com

Systems/Programmer Analysts: Several Sr. and entry level positions available for qualified candidates possessing BS/MS or equivalent and relevant work experience. Work with some of the following DB2, CICS COBOL and VisualAge Generator V3.1. Must be willing to travel and relocate as required. E-mail resume to sanjay@dellemc.com

IT Careers in Telecommunications

Just a year ago, telecommunications companies were duking it out for customers and developing new systems and IT applications to address multiple billings, varied rate structures and expansion into a global market.

Today, the picture has shifted again. The traditional powerhouses of telecommunications are getting a run for the customer and the profits of this industry as voice services begin to look more like a commodity than a unique offering. Instead, the companies are competing with new players. They more comfortably fit into the communications industry where they can leverage their large customer bases with entirely new services, ranging from simple Internet connectivity to web conferencing, cable or data.

It's a shift into the broadband world, where infrastructure and new developments are the required elements to compete – for revenues, but also for employees.



Cap Gemini LLC Clark, NJ

Cap Gemini Group is part of the larger international firm, Cap Gemini LLC, which is in the midst of acquiring consulting firm Ernst & Young. Cap Gemini's Dan Abruscato, director of recruiting and resource allocation, says one of the biggest challenges the firm faces in 2000 is hiring the best and brightest. "We're a much broader organization today," he says, "supporting mobile Internet, DSL, broadband and wireless communication."

Abruscato believes the industry is changing more now than ever before. "There are major changes in the industry the likes of which we've never seen," he says, "and it's due to the growth of package switch technologies. Wireline telephony is converging with wireless technology and a set of underlying technologies that can carry voice, data, messages and video. We're managing existing systems and weaving new services into the mix."

"We are looking to add and train a tremendous number of people by year-end," says Abruscato. "We need Java and Corba skills, a history with telecommunications and subject matter experts." Abruscato also looks for people who have backgrounds in carrier-to-carrier interconnectivity, gateway interfaces and business operations, such as billing and support. "Because the technology is so evolutionary, we need people who have project life-cycle experience, everything from analysis to development to implementation. And, we look for people who understand customer relationships and change – people who can create both."

Cap Gemini has training and development centers in Morristown and Clark, NJ, as well as Cleveland, OH. The company recently

launched a major cross-training and skill-development initiative, known as New Wave. Fifteen people each week are cross-trained into new product areas. "You will have the autonomy to seek your own skill interests, and our commitment is to support the evolution of new technology," Abruscato adds. "We offer excellent projects in web-based solutions, and these are projects that typically last six months to a year, so you will have the opportunity to move on to something new."

"Another real plus for Cap Gemini is that IT professionals will have the opportunity to see different telecom environments around the globe," says Abruscato. "Europe is ahead of the United States in terms of wireless, so it's a great place to learn. You'll learn and see what other countries are doing."

DSL.net New Haven, CT

DSL is the most familiar name in Internet connectivity speed.

What few people know is that DSL.net is a small start-up company with approximately 400 employees and plans to hire more than 600 this year.

Quinn Hedrick, manager of corporate recruiting, says the company assists customers with high-speed Internet access at flat rates, but it also does more: web hosting, remote LAN access or corpo-

rate network access, high-speed access to Internet-based video, virtual private networks, enhanced e-mail and e-commerce. "We offer a suite of services designed to enhance the use of the Internet," says Hedrick. "Once we wire our service to your business, we also monitor your connection and speed to make sure you are getting the best service."

"The best part of working in this environment is that it is dynamic. The online industry is where the most business activity is centered, and this is the backbone of that online world."

Quinn Hedrick
Manager of corporate recruiting
DSL.net

"The best part of working in this environment is that it is dynamic. The online industry is where the most business activity is centered, and this is the backbone of that online world," says Hedrick. "You'll be able to move around, from project to project, to gain experience. We provide training and experience to fill any skill voids. The energy level is high, and you'll be surrounded by a lot of talent and skill."

The DSL.net IT organization is focusing on the company's operations, assuring that the service operates 24-by-7. "Continuously developing this network translates into major IT projects in networking software, architecture and back-end business operation application development," explains Hedrick. "We need people with a telecommunications background or who have worked with an ISP provider. The jobs are everything from network administration to help desk support to application development and implementation."

Evoke Internet Communications Louisville, CO

Voice communications is the tip of the iceberg in the communication industry, according to Evoke Internet Communications. The idea behind Evoke Internet Communications is to use the Internet to expand and enhance communication for businesses. Evoke Internet Communications is an Internet communication service provider. The company creates reliable and flexible ways to communicate by combining the phone and Internet.

The company is focused on new-generation communication – the exchange of voice, video and visuals over the Internet. "We focus on helping businesses use these new capabilities," says Paul Berberian, CEO of Evoke. "We offer a suite of services that target different applications, whether it's a meeting or distribution of content through web casting, or talking e-mail."

"What we've found most challenging is that the Internet market has many niche players – we're spanning across the market to offer an integrated package of services. Bringing together the services is very powerful," says Berberian. "Our software engineers are building cool communication experiences that combine technologies and let technology disappear behind the scenes."

Those who work at Evoke Internet Communications are playing in a large field of opportunities. Developers are working in wireless telephony, voice, streaming, online collaboration and high bandwidth applications. "We need people who are broadly skilled – decathlon people who can jump in and work in multiple problem sets," Berberian says. "We must build in reliability and scalability so that we can offer an industrial strength service."

"We also need people who are open to a variety of technologies – who use what's best to meet a customer's needs," he adds. "We need people who are willing to investigate and research to find that best solution."

"The best part is that you get real-time feedback and the satisfaction of seeing your work used and embraced," Berberian says. "That's what keeps people here – that and the fact that we're constantly giving birth to new ideas and services."

Global Crossing Ltd. Rochester, NY

By now the position of Global Crossing is well known. The one-time transoceanic fiber carrier is building a network of 200,000 fiber optic miles, linking five continents and forming the infrastructure for worldwide communication. It's reason enough for the company to claim some of the best talent in the communications industry. "We deploy global networks with very hot technology," says Laura Ponticello, director of corporate and technical staffing.

Among the company's top goals is to offer seamless end-to-end connectivity from Paris to New York, on to Tokyo. "With the network in place, we will offer customers a diverse array of products," Ponticello says. "On tier with these two goals is that we have an employee population with diverse talents to fuel our growth worldwide."

In addition to the major initiative in deploying the fiber-optic network, Global Crossing is rolling out an SAP implementation that will touch finance, payroll and human resources. The internal project is critical as the company continues its growth march. "We also are focused on product development," says Ponticello,



pointing to projects in voice-over-IP technology, software and hardware. "We need engineers with network design or UNIX experience, software engineers, systems analysts and network architecture designers."

The company has an aggressive college recruiting effort to hire network engineers. Once on board at Global Crossing, employees receive 100 percent tuition reimbursement for degrees up to a Ph.D. "And you can choose between technical and management career paths," Ponticello adds.

In examining resumes, Ponticello looks for people with intern or work experiences and degrees in computer science or electrical engineering. For more experienced hires, she is looking for people with three to five years experience in a communications or software company. "We also need people with excellent interpersonal skills, who can deal with the customer at all levels, and someone who has spirit."

The company offers locations in Rochester; Morristown, NJ; Beverly Hills; Detroit; Sunnyvale, CA; London; and Amsterdam.

Riverstone Networks, Inc. Santa Clara, CA

In just over six months Riverstone Networks has grown from an idea to more than 300 employees. The company provides infrastructure solutions for metro area networks, and its customers include Internet providers, application service providers and content service providers. The list includes British Telephone, MCI Worldcom, Telefonica and Earthlink.

"Our products are Internet routers, application-aware switch routers, intelligent load balancers, web cache redirectors and software tools for provisioning, billing, monitoring, and managing service level agreements. Our products enable rapid deployment of high speed service rich infrastructure," explains Andrew Feldman, vice president of corporate marketing and corporate development.

The company is searching for engineers with four to five years of experience in hardware or software design. "We need top caliber people who are seeking to work with an extraordinary team and who are willing to commit the energy and time required in a high profile start-up," says Feldman.

While the company is young, Riverstone can boast of a highly experienced management team. "Our management team is proven," says Feldman, "and they led such companies as Yago and Cabeltron."

"It's an exciting space to be in. Unlike many start-ups we have a revenue stream measured in the tens of millions already," he adds. "The colleagues you'll work with at Riverstone are unparalleled. If you are seeking to work on best of breed technology, while working with truly phenomenal colleagues, then you should consider Riverstone Networks."

SBC San Antonio, TX

Through its subsidiary brands (Southwestern Bell, Ameritech, Pacific Bell, SBC Telecom, Nevada Bell, SNET and Cellular One) and world-class network, SBC provides local and long distance phone service, wireless and data communications, paging, high-speed Internet access and messaging, cable and satellite television, security services and telecommunications equipment, as well as directory advertising and publishing. Internationally, SBC has telecommunications investment in 22 countries. With more than 208,000 employees, SBC is the 13th largest employer in the United States.

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Andrew Feldman
vice president of
corporate marketing and corporate development
RiverStone Networks, Inc.

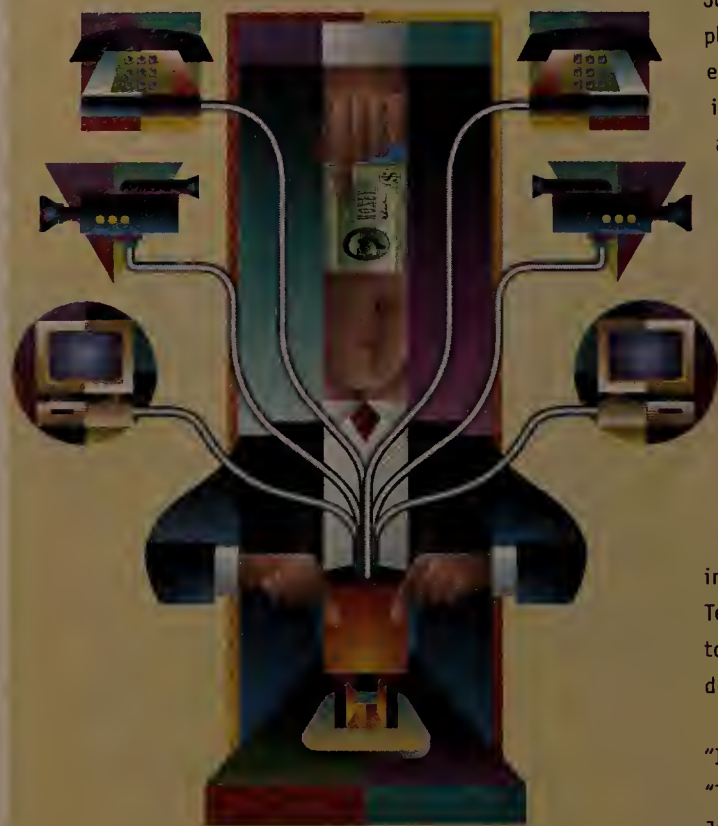
SBC's growth strategy is focused on initiatives in data services, wireless services, long distance and national expansion. Most can't be accomplished without a software system or billing capability that's ready when the company wants to go to the marketplace. It's the job of SBC's information technology organization to provide a competitive advantage to the corporate business units by delivering the systems and capabilities needed to achieve their operational goals. At the same time, IT makes sure existing systems run smoothly and efficiently for the benefit of the company's customers and employees.

"SBC has approximately 17,000 employees working in the IT organization," says Renee Schneider, executive director of information technology management staffing and contractor acquisition, "with key population centers in St. Louis, San Ramon (CA), Chicago, Dallas, Houston, New Haven, San Diego, Sacramento and Troy (MI)."

"We're a state-of-the-art organization," continues Schneider, "with responsibility for all enterprise software solutions, data center operations, desktop and other infrastructure issues, and IT

functions for SBC's wireless, long distance, and directory operations. While SBC is looking for relational database, software and system developers, the focus is on people with strong IT skills who are excited about working in data, web or telephony, the more skill sets, the more versatile the assignments."

SBC offers both managerial and technical career paths. "More and more we're looking for business skills because of our need to closely align with our business units," says Schneider. "We're a company that has been built on internal promotion. If you are doing a good job, we will let you try something entirely new — and train you in the skills that will help you succeed. We know that people change employers when they're no longer challenged, so we work with you to provide new challenges within the same company."



"When all is said and done," says Schneider, "the right job is about enjoying what you do. People here enjoy their work and the critical role we play in the success of SBC."

Sprint Kansas City, MO

While Sprint is destined to take on the name Worldcom later this year, the company continues to build its IT presence at the Kansas City location. According to Ric Walter, assistant vice president for human resources, Sprint's IT organization develops, implements and maintains services for the long-distance network.

Among the top IT projects is Sprint ION, an integrated on-demand network. "Basically, Sprint ION takes broadband into the home," explains Walter. "We are looking to the IT professionals to help us with software to program, to support billing and to support all aspects of the business infrastructure."

Sprint has a robust college-recruiting program that brings in 300 computer science graduates each year. After completing training specific to Sprint platforms and systems, they are then assigned to a wide range of projects. In reviewing applications, Walter looks for a strong educational background, demonstration of diverse experiences and the ability to be a contributor or leader on successful projects. The company seeks employees for electrical engineering, computer science, desktop support, programming, systems engineering and network design.

"We continue to support ongoing learning through formal classroom settings and computer-based programs," says Walter. "We do have a formal career path effort to make sure that people get the experiences they need to be happy in their careers. With the merger with Worldcom, you'll be able to take your career any place."

Walter says one of the most attractive aspects of Sprint is that it is viewed as an innovator in the telecommunications industry. "From the first fiber-optic network to Sprint ION, innovation has been the underpinning of our organization," he says. "Sprint PCS was launched using leading-edge technologies. We frequently are the company that is out in front, because that's the only way to stay on top of the market."

Just as important, Walter believes, is the environment in which people work. "You'll be working with your friends at Sprint. We offer an environment that's conducive to your personal growth and what's important to you. We offer a challenging work environment, but we also offer flexible work schedules and encourage employees to get involved with their communities. We want people to do those things away from work that keep them sharp."

Tellabs, Inc. Warrenville, IL

As with many telecommunications companies, the shift to e-commerce and an e-world is all new for Tellabs, Inc. "We have always designed, developed and produced telecommunications equipment," says Debbie Toms, senior technical recruiter at Tellabs. The company is now extending its operations as the infrastructure builder of the industry. By partnering with communication service providers around the world, Tellabs is developing products and services that allow customers to offer new revenue-generating services while driving down costs.

"In the past we hired mostly electrical engineers," says Toms. "Today we're looking for people who have skills in HTML and Java. The objective is to move us ahead in e-commerce, focusing on electronic transactions. We use SAP as the backbone of our business operations in a client/server environment. Now we need web-enabled applications, systems and networking."

Listed among *Fortune Magazine's* "100 Best Companies to Work for in America", Tellabs hires approximately 40 percent of its employees based on employee referrals. In 1999, 89 percent of employees said they would recommend the company to friends and family seeking employment. "That is quite a statement about Tellabs," says Toms. "About 50 percent of our positions are filled by people from within the company."

The company continues to focus on people as its strength. In developing the new company headquarters building in Napierville, IL, the design includes health facilities run by a professional health fitness firm and onsite daycare. A group known as DreamQuest is dedicated to working with each employee on long-term goals and how the company can support individuals in terms of job opportunities and ongoing learning.

Tellabs has major development sites in Denmark, Finland and Ireland. "We focus on people being excited about their work versus being stressed," adds Toms. "You can tell the difference when you walk in — the undertow is one of excitement and staying on top."

VoiceStream Wireless Corp. Bellevue, WA

In less than a decade, VoiceStream Wireless has grown to provide wireless phone service in 23 of the 25 major markets in the United States. It's part of the continued national expansion of the company. A portion of the growth has come from mergers and acquisitions. This year, VoiceStream is combining its assets with those of Omnipoint and Aerial to serve more than 1.8 million customers.

And that's presenting an internal and external challenge for VoiceStream's IT professionals. Julie Pollard, vice president of customer operations and systems, says among the first initiatives is assuring that seven different call centers offer the same service to customers and the company has a common platform to support all facets of the business. "We're responsible for these initiatives, along with many others up to and including the integration of web services with the wireless world," she says.

Pollard's organization is the IT hub, while distinctly not including information technology in its name. "We're the framework for the company, and we're involved in everything from combining three large companies on to a consistent platform to developing services," she says. "As the backbone of overall services delivery, we have a business objective beyond a specific technology."

"The fundamental is that this company has to be constantly available and ready for change. In IT that means that we must avoid restrictive standards and instead offer guidelines that allow us to be incredibly flexible. The technology is going to change, therefore, we have to be ready to change as well."

Pollard plans to hire about 100 IT professionals in the coming months. "Strong technical skills are a given," she says. "It's more difficult to find someone who has that entrepreneurial aptitude, who looks for opportunities to make change. These are the kinds of people we take in a heartbeat over those who may have more experience but not the characteristics. We look for people who have shown a consistent pattern within their careers for finding new opportunities and challenges within the same company."

According to Pollard, VoiceStream offers technical challenges ranging from call center to billing, product development to web-enablement. "We look for people who may have core competencies but who have a desire to broaden and stretch to other areas," she says. "I don't think there is another company that offers the number of technical opportunities that we can."

The company offers a casual environment that is about more than merely clothing, according to Pollard. "We avoid rigid structure. You make decisions. You make things happen. That's the best training ground you can get."

For more job opportunities with communications companies, turn to the pages of IT Careers.

Interested in IT Careers?

If you'd like to take part in an upcoming IT Careers feature, contact Janis Crowley, 650.312.0607 or janis_crowley@itcareers.net.

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Reynolds & Reynolds	-0.13
Avid Technology	-0.06
Banyan Systems Inc.	-0.01
Baan Co. NV	0.0

SEC May Loosen Reins on Foreign Biz

Mulls relaxing rules for stock listings in U.S.

BY MARIA TROMBLY

AMERICAN COMPANIES have long worried about foreign competition for customers — now they're increasingly starting to worry about foreign competition for investment dollars as well.

The Securities and Exchange Commission (SEC) recently finished receiving comments about a proposal that would allow foreign companies to be listed on U.S. stock exchanges without having to comply with U.S. accounting rules.

More than 1,200 foreign companies are already listed on U.S. markets, according to the SEC, but they have to comply with the U.S. Generally Accepted Accounting Principles (GAAP).

Under the SEC proposal, foreign companies would only have to comply with the International Accounting Standards (IAS), which are set by the International Accounting Standards Commission (IASC) in London.

Endorsement Unlikely

In general, IAS rules are looser than GAAP rules and give companies more leeway in how they add up their numbers, which would give companies that follow IAS an unfair advantage in shoring up their bottom lines, says Roger Jahnke, director of international accounting standards at New York-based Ernst & Young International.

For example, U.S. GAAP rules require companies to take a charge when

granting stock options. However, IAS rules don't, which would make foreign companies look more profitable than domestic ones, according to Alfred Popken, a director in New York-based PricewaterhouseCoopers' global capital markets group.

In fact, Popken adds, the U.S. has the strictest accounting standards on the planet.

As a result, some foreign companies are jumping on the U.S. GAAP bandwagon to gain the credibility that SEC approval gives them, Popken says.

According to Popken, the SEC isn't likely to endorse the

IAS until that set of standards becomes as tough and comprehensive as the U.S. GAAP. But international pressure for one set of common rules is increasing.

Last month, at an annual meeting in Sydney, Australia, the International Organization of Securities Commissions said it would back the IAS for cross-border offerings and listings. This worries some American accountants.

"I believe that the SEC should either continue to require companies to reconcile to U.S. GAAP or, if they want to allow foreign companies to come into the U.S. under IAS, they should also allow U.S. companies to choose IAS," Jahnke says. "We ought to have a level playing field."

However, "we consider that the recognition and measurement requirements of IASC standards are sufficiently robust not to require a reconciliation to U.S. GAAP in cross-border filings," says Bryce Denison, national president of the Group of 100 Inc., an Australian organization of senior finance and accounting professionals that monitors international regulatory issues. ▀

52- WEEK RANGE

JUNE 2 2 PM

WK NET CHANGE

WK PCT CHANGE

SOFTWARE UP 18.6%

ASWX	149.12	11.00	Active Software	45.75	17.13	59.8
AOBE	131.00	30.81	Adobe Systems Inc.	124.13	20.63	19.9
ARBA	183.34	15.25	Ariba Inc.	67.94	16.81	32.9
AZPN	55.37	8.12	Aspen Technology Inc.	25.81	5.88	29.5
AOSK	56.06	17.00	Autodesk Inc.	41.00	5.34	15.0
AVIO	25.56	9.43	Avid Technology	10.25	-0.08	-0.6
BAANF	17.81	1.12	Baan Co. N.V.	2.56	0.00	0.0
BMC5	66.62	36.00	BMC Software Inc.	46.34	4.28	10.2
BOBJ	150.87	11.06	Business Objects S.A.	94.25	21.00	28.7
CON	24.62	9.18	Cadence Design Systems	18.88	4.88	34.8
CHKP	295.00	16.62	Checkpoint Software Tech. Ltd.	218.63	61.69	39.3
CTXS	122.31	20.18	Citrix Systems Inc.	57.88	11.94	26.0
COGN	41.12	9.68	Cognos Inc.	39.56	6.88	21.0
CA	79.43	40.93	Computer Associates Int'l Inc.	57.25	6.56	12.9
CPWR	40.00	9.25	Compuser Corp.	11.56	2.09	22.1
OCTM	106.00	12.18	Docuementum	61.38	12.38	25.3
EFIL	89.31	35.00	Electronics For Imaging	36.44	-5.69	-13.5
HNC5	130.00	18.00	Hnc Software	46.94	8.69	22.7
HYSL	65.00	12.00	Hyperion Software	33.63	7.44	28.4
IOXC	49.12	14.06	IOX Systems	16.38	1.13	7.4
INFA	110.87	9.50	Informatica Corp.	50.69	9.94	24.4
IFMX	21.25	6.03	Informix Software Inc.	8.72	2.06	31.0
INTU	90.00	22.50	Intuit	40.31	7.69	23.6
JKHY	48.50	15.50	Jack Henry Associates	48.50	9.44	24.2
JDEC	48.31	10.25	J.D. Edwards & Co.	14.00	2.19	18.5
LGT0E	82.50	10.50	Legato Systems Inc.	12.81	2.87	28.9
MACR	100.00	27.37	Macromedia Inc.	88.88	10.88	13.9
MANU	70.25	7.50	Manugistics Group Inc.	34.63	5.38	18.4
MENT	18.50	7.75	Menlo Graphics	18.38	1.88	11.4
MSFT	119.93	60.37	Microsoft Corp.	65.50	4.50	7.4
NETA	37.18	11.62	Network Associates	24.50	4.31	21.4
GMH	140.00	48.75	Network General	107.75	13.00	13.7
NOVL	44.56	7.87	Novell Inc.	8.83	0.69	8.7
ORCL	90.00	11.28	Oracle Corp.	79.50	13.56	20.6
PMTS	35.93	7.37	Parametric Technology Corp.	10.88	2.88	35.9
PSFT	27.75	12.00	PeopleSoft Inc.	14.81	1.50	11.3
PIXR	50.62	33.12	Pixar	35.81	2.13	6.3
RATL	105.00	26.37	Rational Software Corp.	84.63	15.88	23.1
RHAT	151.31	7.00	Red Hat Inc.	19.38	3.25	20.2
QSFT	98.12	7.00	Quest Software	46.38	8.25	21.6
SAP	85.93	29.37	SAP AG	48.88	6.88	16.4
SCUR	29.62	2.25	Secure Computing Corp.	13.44	2.69	25.0
SORC	23.43	8.81	Structural Dynamics Research	11.25	-0.13	-1.1
SYBS	31.00	7.12	Sybase Inc.	20.19	1.44	7.7
SYMC	81.62	17.75	Symantec Corp.	69.63	7.19	11.5
SNPS	75.82	36.87	Synopsis	51.00	9.13	21.8
SCTC	28.37	10.00	Systems & Computer Technology	20.81	3.06	17.3
TIBX	147.00	5.00	Tibco Software Inc.	67.00	15.50	30.1
TSAI	48.12	11.37	Transaction Sys. Architects	14.25	2.25	18.8
VRTS	174.00	15.05	Veritas Software Corp.	132.75	27.25	25.8
WINO	66.12	13.37	Wind River Systems Inc.	36.63	4.19	12.9

TELECOMMUNICATIONS CARRIERS UP 10.4%

AT	91.81	55.87	Alltel Corp.	65.69	5.19	8.6
ANOW	38.94	11.18	Andrew Corp.	38.94	5.81	17.5
T	63.00	33.62	AT&T	36.00	1.00	2.9
BCE	137.50	21.06	BCE Inc.	23.69	2.00	9.2
BEL	69.50	47.37	Bell Atlantic	53.63	1.50	2.9
BLS	53.50	34.93	Bell South	45.88	-1.44	-3.0
BRW	41.06	16.31	Cincinnati Bell Inc.	26.81	2.81	11.7
CMCSK	57.68	27.87	Comcast	39.31	7.75	24.6
CQ	37.06	15.37	Comsat Corp.	25.56	1.50	6.2
COX	58.37	33.37	Cox Communications Inc.	46.88	7.63	19.4
QSTRF	53.75	7.87	Globalstar Telecom. Ltd.	9.13	0.13	1.4
GTE	78.50	55.81	GTE Corp.	63.94	1.94	3.1
NXTL	165.87	33.00	NexTel Communications	99.13	17.63	21.6
SPOT	74.25	29.00	Panamsat	49.00	6.38	15.0
QCOM	200.00	21.51	Qualcomm	69.25	6.00	9.5
SBC	59.87	34.81	SBC Communications	45.13	2.19	5.1
FOH	75.93	42.62	Sprint Corp.	62.00	4.89	8.2
TO5	137.00	59.75	Telephone and Data Systems	111.63	8.69	8.4
USW	81.50	51.50	U.S. West	74.56	3.56	5.0
VIA	66.38	36.68	Viacom	66.38	9.88	17.5
WCII	66.50	24.00	Winstar Communications Inc.	33.63	7.00	26.3
WCOM	64.51	35.87	MCI Worldcom Inc.	40.25	2.69	7.2

SERVICES UP 9.9%

ACXM	35.93	14.56	Axiom Corp.	31.19	2.75	9.7
ACS	53.00	31.00	Affiliated Computer Servs	37.13	4.13	12.5
AMSY	44.37	19.75	American Mgt. Systems	39.56	3.44	9.5
AUD	56.88	37.37	Automatic Data Processing	56.88	3.44	6.4
BSVS	69.00	41.37	Bisys Group Inc.	62.63	3.63	6.1
CATP	27.00	6.75	Cambridge Technology Ptnrs	8.44	1.19	16.4
CEN	36.87	14.75	Ceridian	25.13	1.81	7.8
CBR	29.81	13.75	Ciber Inc.	17.56	2.06	13.3
COO	57.25	17.43	Comdisco	29.38	4.00	15.8
CHRS	27.12	10.37	Computer Horizons Corp.	11.94	1.13	10.4
CSC	99.87	57.31	Computer Sciences	90.19	0.81	0.9
OST	79.69	51.18	Ost Systems Inc.	79.69	7.88	11.0
EOS	76.68	47.87	Electronic Data Systems	64.56	2.56	4.1
FOC	56.68	38.93	First Data Group	55.13	4.25	8.4
FISV	48.62	24.12	Fiserv	47.94	5.88	14.0
IT	24.93	9.56	Garlner Group	14.00	1.69	13.7
KEA	35.00	18.06	Keane	27.00	0.31	1.2
NOC	52.06	21.75	National Data	22.25	0.13	0.6
PAYX	40.00	15.70	Paychex Inc.	37.31	3.63	10.8
PER	33.62	14.75	Perot Systems Corp.	15.44	0.19	1.2
REGI	9.75	1.75	Renaissance Worldwide	2.25	0.28	14.3
REY	33.00	17.75	Reynolds & Reynolds	22.00	-0.13	-0.6
SFE	99.00	15.85	Salegard Scientifics	36.81	6.25	20.4
SAPE	151.18	23.87	Sapient Corp.	117.50	21.25	22.1
SMS	73.50	35.50	Shared Medical Systems	72.75	0.44	0.6
SOS	40.00	16.87	Sungard Data Systems	34.63	3.88	12.6
SYNT	20.93	7.75	Syntel Inc.	11.94	0.31	2.7
TECO	44.68	18.00	Tech Data	39.69	2.25	6.0
TENF	76.87	15.25	TenFold Corp.	20.44	4.44	27.7
TSS	20.62	14.12	Total System Services Inc.	20.06	1.56	8.4
TSAL	48.12	11.37	Transaction Sys. Architects	14.25	2.25	18.8

NETWORK UP 18.0%

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AOCT	74.50	17.18	AOC Telecommunications Inc.	74.50	13.38	21.9
ANTC	61.25	23.25	Antec	53.31	6.31	13.4
BNYN	40.56	6.25	Banyan Systems Inc.	9.13	-0.01	-0.1
CS	52.75	8.50	Cabletron Systems	22.88	1.88	8.9
CNEBF	8.00	2.62	Call-Net Enterprises	2.63	-0.31	-10.6
CSCO	82.00	25.93	Cisco Systems Inc.	64.38	10.69	19.9
ECIL	39.43	23.75	ECI Telecom	29.13	4.08	16.2
ENTU	150.00	16.87	Entrust Technologies Inc.	56.13	13.38	31.3
HRS	40.62	15.50	Harris Corp.	32.88	3.75	12.9
GMH	140.00	48.75	Hughes Electronics/GM	107.75	13.00	13.7
ERIC	26.31	6.59	LM Ericsson	22.44	4.44	24.7
JNPR	312.93	11.33	Juniper Networks Inc.	207.31	59.00	39.8
LU	84.18	49.81	Lucent Technologies	62.56	7.56	13.8
MADGF	17.37	1.43	Madge Networks	4.81	1.31	37.5
NCOI	9.62	1.31	Network Computing Dev	1.69	0.09	5.9

52- WEEK RANGE

JUNE 2 2 PM

WK NET CHANGE

WK PCT CHANGE

NWK	14.81	7.31	Network Equipment Tech.	10.38	2.19	26.7
NN	43.62	14.00	Newbridge Networks	35.50	0.00	0.0
NOK	60.00	16.92	Nokia Corp.	57.88	10.08	21.0
NT	72.09	16.64	Northern Telecom Ltd.	59.81	8.31	16.1
PAIR	31.63	8.00	Pairgain Technologies Inc.	31.63	5.81	22.5
PCTL	15.21	2.75	Picturatel	3.25	0.34	11.8
SFA	77.00	15.84	Scientific Atlanta	83.13	12.06	23.6
TLA8	77.25	41.81	Tellabs Inc.	65.22	4.91	8.1
USW	81.50	51.50	U.S. West	74.56	3.56	5.0
VRK	22.00	1.81	Verilink	8.13	1.75	27.5
WSTL	40.75	5.50	Westell Technology Inc.	19.69	6.56	50.0

SEMICONDUCTORS CHIPS & EQUIPMENT UP 25.1%

AOPT	63.58	15.43	Adaptec Inc.	21.13	3.13	17.4
AMO	92.87	15.82	Advanced Micro Devices	88.19	15.13	20.7
ALTR	108.00	30.00	Altera	95.94	18.31	23.6
AOI	94.68	17.53	Analog Devices	87.00	19.75	29.4
AMAT	115.00	25.37	Applied Materials	92.69	18.81	25.5

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Firms Purging Staff With Obsolete Skills

Despite employee shortages, firms say some workers can't learn hot skills fast enough

BY KATHLEEN MELYMUKA

THE HUNGRIEST information technology labor market in history is a fussy eater. If it wants sushi and all you can offer is quiche, you're out the door quicker than stale bread.

That has been proved by a spate of recent layoffs among IT vendors and service providers, including IBM, Hewlett-Packard Co., KPMG Consulting and Ernst & Young LLP.

Those layoffs are different from job reductions at companies such as Compaq Computer Corp. and Xerox Corp., which recently announced cuts in an attempt to bolster sagging profits. Nor are they like terminations among the dot-coms that have hit the skids. They're not workforce reductions; they're strategic

divestitures of people who have unwanted skills. The vendors are dumping staffers with tepid IT skills out the back door while luring hot new talent in the front, analysts said.

These problems will have a direct impact on user companies that continue to get more of their technical specialists from contracting and consulting firms while reserving staff jobs for business technol-

ogists with deep knowledge of their particular industry, said David Foote, a managing partner at human resources consultancy Foote Partners LLC in New Canaan, Conn.

"The big problem consultants have is the ability to reskill quickly enough to capture new business," said Tom Rodenhauser, president of ConsultingInfo.com in Keene, N.H. Established companies that might be loaded with enterprise resource planning skills have a real problem keeping up with the electronic-business expertise of nimble

boutique players, for example.

In these circumstances, retraining isn't always practical. "They've got to turn a lot of grunt soldiers into Army Rangers, and that's difficult," Rodenhauser said. "It creates the strange circumstance of laying off on one hand and desperately looking for skills on the other."

Weighing the Options

For example, last week, IBM Global Services announced that it was terminating the jobs of about 1,000 U.S. specialists in Y2k and other completed projects. Spokesman Scott Brooks said the company's first choice is always to retain and retrain. "But retraining is weighed against other candidates for the jobs who may have skills that are better," he explained.

Similarly, HP recently announced that it would turn over about 5% of its workforce this year, and New York-based Ernst & Young laid off 5% of its consultants in February.

Foote agreed that retraining is easier said than done. "Usually, less than 5% [of workers] can do that," he said. And many have personal agendas about what training they want that may or may not mesh with

the needs of their companies.

To realign skill sets for the Internet economy, KPMG Consulting LLC, a division of KPMG LLP in New York, recently laid off 350 consultants, even though it expects to hire 2,000 new ones this year. The company is looking for specific technical expertise, not just general management skills, according to spokeswoman KPMG Elizabeth Brooks. "You can't just do strategy. You have to understand the technology that you're building the strategy around," she said.

Despite the "huge emphasis" the firm puts on training, it isn't enough to get workers up to speed in highly technical areas with which they are unfamiliar. For example, Brooks said, at KPMG, the integration of legacy telecommunications infrastructures with Internet technologies is among the hottest skills. "That's a pretty specific skill set, and you can't just send someone to school for a few months to learn that," she said.

Today, speed is everything, Rodenhauser said. "The suddenness and incredible demand for e-business projects is overwhelming for everybody," he said. "It's a feeding-frenzy mentality: How can we get our share?"

Layoffs Amid a Labor Shortage

COMPANY	EMPLOYEES LAID OFF
IBM Global Services	1,000
Hewlett-Packard	5% of worldwide workforce
KPMG Consulting	350
Ernst & Young	5% of consultants

Meanwhile, this year there will be 1.6 million IT job openings in the U.S., and half of them will go unfilled, according to the Information Technology Association of America.

Continued from page 1

INS Backlog

should consider ways to streamline the green-card application process. "There is such a shortage of technology talent today and when we don't have the [talent], it affects the bottom line. There's an opportunity cost."

Inefficiencies in processing green cards for employment — rather than for foreign family members — have led to a growing chorus urging Congress to fix the visa system. For example, technology bigwigs Linus Torvalds, Esther Dyson and Steve Wozniak recently signed a letter to Congress on behalf of the Immigration Reform Coalition to help foreign workers attain permanent status.

Raj Shah, CEO of Capital

Technology Information Services, Inc. (CTIS) in Rockville, Md., said the problems in green-card processing impede not only how he runs his business, but also the economy as a whole. Every foreign employee Shah hires to perform development work creates demand for another three U.S. workers, whom he assigns to maintenance, training and testing-related jobs.

DeFruscio said employers have an easier time receiving green-card approvals if a foreign worker has spent time in the U.S. When a company files a green-card application, it must prove that the person possesses "specialized skill or knowledge that doesn't displace" a U.S. worker.

Schmidt said the INS backlog on visa processing dates to almost two years ago, when the agency saw a large increase in the number of visa applica-

tions. Right now, it takes an average of 33 months to process a green-card application for a foreign national, but the INS hopes to reduce that to 24 months by the end of this year.

For workers from India or China, the wait can be up to five or six years because the number of applicants from those countries regularly exceeds the 9,800-person limit on immigrants from any single country, said Liz Stern, an immigration attorney at Shaw Pittman in Washington.

Some employers may lose H-1B holders who reach the six-year limit on their visas without obtaining permanent-resident status, said Stern.

John Nahajzer, senior immigration counsel at MicroStrategy Inc. in Vienna, Va., said it would be devastating to lose an H-1B holder who has been with the company for six years.

Tips for Handling Worker Visas

Employers have developed a series of tactics for dealing with the long delays their workers face in applying for permanent residency from the INS.

Key among them is to start the process early — as soon as 90 days after the employee gets a temporary visa, according to Los Angeles-based immigration attorney Carl Shusterman. "Employers' biggest mistake is that they don't start the paperwork process soon enough, [and] they have to lose the employee."

John Nahajzer, a senior immigration attorney at MicroStrategy Inc. in Vienna, Va., agreed. "As soon as I get an H-1B, I'm thinking permanent residence," he said. Knowing that green-card applications can take years to process, Nahajzer maintains an application that maps the permanent-resident

status of each foreign employee.

MicroStrategy sponsors 100 to 140 foreign workers (5% to 7% of its workforce) for green cards. These workers hold either H-1B visas or an intercompany visa, which allows multinationals to transfer an overseas employee who has worked at the company for at least one year.

If a foreign worker's visa expires before the INS grants a permanent visa, the employee has to file the last stage of the green-card application process at the U.S. embassy in his last country of residence, according to Liz Stern, an immigration attorney at Shaw Pittman in Washington.

Companies can also re-apply for a temporary visa once the employee has been abroad for at least one year, said Stern.

— Julekha Dash



FRANK HAYES/FRANKLY SPEAKING

The worst case

WHAT'S THE WORST-CASE Microsoft scenario? Suppose Microsoft loses its appeal and faces being split up by Judge Thomas Penfield Jackson. What then? Microsoft's lawyers and executives call any breakup a death sentence, but each piece of a sliced-in-two Microsoft would still be huge compared with most software companies. The pieces could survive.

The real problems — at least for corporate IT shops — will show up if cooler heads don't prevail in Redmond. Any extreme reactions

from Microsoft could disrupt our ability to get the products we need — and that would send us scrambling for replacements, alternatives and new strategies. We'd better be ready.

So what are the worst-case scenarios? And how bad could it get?

Suppose...

Bill Gates walks away. Don't laugh — that's what Bill Boeing did when the federal government broke up his Seattle-based high-tech monopoly in 1934. Microsoft (or Microsofts) would survive if Gates cashed in his stock and went home — Gates hasn't been crucial to the company's technology for more than a decade. But until a new leader emerged, confidence in Microsoft would plummet — and so would the stock price.

Gates tries to shut down the company instead of breaking it up. Very ugly. Shareholder lawsuits would stop the shutdown, but in the meantime, we'd face product-availability chaos.

Top technical talent deserts Microsoft. Management brain drain is already a problem, since so many top executives have left recently. But for techies it's another story. Microsoft doesn't depend on a few technical gurus but on mass mobilization of an army of bright young kids hired straight out of school. As long as there are computer science graduates, Microsoft can get the technical talent it needs.

Microsoft competes with itself and produces incompatible products. A survivable problem. Today, Microsoft has hundreds of competitors that produce products more compatible with past and current Microsoft products than Microsoft itself. Microsoft can learn how, too.

Class-action lawsuits drain Microsoft financially so it can no longer develop or buy new technology. It

could happen, but more likely Microsoft will settle as many lawsuits as quickly and cheaply as possible, the way it settled the Caldera suit. **Microsoft violates court-ordered restrictions on its behavior** and gets slapped with even more limits. Remember, this is the company that presented a doctored videotape as trial evidence and swore it was authentic. The more limits, the more

some Microsoft employees will push those limits and break the rules. Unless Microsoft's executives and managers take the court's orders very seriously — and enforce them scrupulously — Microsoft could face an escalating spiral of crippling restrictions.

The broken-up Microsoft companies break themselves up further, making them prime acquisition targets. In that case, forget about complex integration between ex-Microsoft applications — especially if their new owners are direct competitors.

The new Windows operating system company merges with a PC vendor. Insanely stupid, since Windows would suddenly become much less attractive to all the other PC vendors. But don't put it past a broken-up Microsoft's new management.

An unexpected technology shift renders Microsoft irrelevant. And won't Judge Jackson feel silly? Bad news for Microsoft, catastrophic for the rest of us who would have to absorb that huge

technology change. If it really would make Microsoft irrelevant, it would make most of our skills irrelevant, too. ▀

Hayes, Computerworld's staff columnist, never envisioned a worst-case scenario in which he would cover IT for more than 20 years. His e-mail address is frank_hayes@computerworld.com.

The real problems will show up if cooler heads don't prevail.



SHARK TANK

FOR OLD TIMES' SAKE Manufacturing company cans its CEO. Six months later, he lands a job elsewhere and calls our pilot fish, a system administrator at the manufacturer. "I check my voice mail," the fish says, "to hear our ex-CEO say: 'Hey, I tried dialing into the network over the weekend, but every time it wouldn't let me in. Can you give me a call and let me know when you have it fixed?'"

WORKING IN THE WEE SMALL HOURS, this developer pilot fish's machine suddenly stops echoing keystrokes; the server he's connected to "appears to have dropped dead." He checks the computer room and finds a newly hired security guard peering into the electrical panel box and switching off circuit breakers. "I asked him what he was doing, and he said he was trying to turn off the lights," says the fish. "For his future reference, I pointed him to the light switch."

GET THE MESSAGE? This help desk pilot fish takes a call from a company honcho and dispatches a trouble ticket and a tech pronto. Hours later, the honcho calls our fish back: "Where's the tech you promised ASAP?" The fish tracks down the tech, who explains that he went to the user's office, found

it empty and e-mailed him to call when he returned. Growls the fish, "The user's problem — clearly stated in the trouble ticket — was that his e-mail wasn't working."

TWO YEARS of cleaning up a worse-than-typical mess gets this one-man-IT-shop pilot fish his reward: a pink slip, because, the boss says, "computers don't need programmers or operators; they can run themselves." The fish resists an urge to booby-trap the systems, but it doesn't really matter. After six months of "running themselves," he hears, the systems are "so far out of sync with everything that they're totally useless" — and the company has gone back to manual book-keeping.

DON'T BLINK On May 31, this pilot fish's company buys Web application server licenses. Server vendor e-mails license keys and info on support options. "One line caught my eye," says the fish. "You will receive free upgrades of this commercial license until June 1. You can also continue to use the server after this date."

Tell Sharky your tale. If it prints, you get a sharp Shark shirt: sharky@computerworld.com. And get more every day at computerworld.com/sharky.

The 5th Wave



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